Prepared for:

ALBANY
INTERNATIONAL AIRPORT

Airport Master Plan

Albany International Airport

Master Plan Report
FINAL

June 2024

Prepared by:

CHA

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1 Introduction

The Albany County Airport Authority (ACAA) has retained CHA Consulting, Inc. ('CHA') to prepare a Master Plan Update (Study) for the Albany International Airport ('ALB' or 'the Airport'). The purpose of the study is to evaluate the current utilization and operational characteristics of the airfield, commercial service facilities, general aviation and support facilities, ground access, and land development considerations. It is the intent to consider all alternatives that can be developed in a logical and financially feasible manner that ensure the best use of space for the continued improvements necessary to accommodate projected aviation activity throughout the 20-year planning period.

This introductory chapter provides a description of the project and a background overview of the Airport and its facilities. Additional information about the Airport and the Study can be found on its website at www.alb-master-plan.com. The Airport's website has airport information including maps, driving directions, ground transportation, and parking information.

1.1 Project Description

The airport master planning process assesses how well an airport services existing users, is equipped to meet future demands, and fulfills Federal Aviation Administration (FAA) safety and design standards. The process includes the development of activity forecasts, the identification and evaluation of financial, physical, and environmental issues, and the recommendation of feasible improvements.

An airport master plan is a comprehensive study of an airport that is conducted via a systematic process that evaluates existing facility, identifies anticipated facility needs, and formulates short-, medium-, and long-term development plans to meet future aviation demand. The process, methods and ultimate products are guided by Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. Consistent with this guidance, this Master Plan Update provides recommendations for the improvement and development of the Airport. The recommendations are intended to satisfy aviation demand, minimize environmental impacts, and address community concerns. The study follows the format and design criteria outlined in all Advisory Circulars, including, but not limited to:

- FAA Advisory Circular 150/5070-6B, "*Airport Master Plans"*
- FAA Advisory Circular 150/5300-13B "*Airport Design*"
- Federal Aviation Regulation (FAR) Part 77, "*Safe, Efficient Use, and Preservation of the Navigable Airspace*"

The products of the study include this narrative report and an Airport Layout Plan (ALP). The ALP illustrates the existing and proposed airport facilities and will be formally approved by the ACAA and FAA. Several additional drawings that illustrate the surrounding airspace, adjacent land use, and airport property support the ALP. The combined set of drawings is called the ALP Drawing Set.

Note that approval of the ALP does not represent a commitment by the ACAA or the FAA to undertake or financially support the proposed projects, nor does it constitute any environmental approval. However, the FAA's approval of the Forecast and ALP, and acceptance of the Master Plan Update is necessary for specific projects to become eligible for federal and state funding.

1.2 Regional and Airport Overview

ALB is the sole scheduled service airport in the Upper Hudson and Lower Lake Champlain Valley, serving the Greater Capital District and fifteen counties within the Primary Airport Market Area. ALB is a public-use airport owned and operated by the Albany County Airport Authority. According to the FAA's 2021 – 2025 National Plan of Integrated Airport Systems (NPIAS) Report, ALB is designated as a Primary Commercial Service Small Hub Airport.

1.3 Airport History

ALB is derived from the country's first municipal airport located at a former polo field on Loudonville Road, three miles north of the city. The Airport then relocated to Westerlo Field before moving to its current location on Albany Shaker Road in 1928 with the help of the Watervliet Shakers.

The Airport was officially opened on October 3, 1928 as the Albany Municipal Airport. The original airfield consisted of three runways ranging from 2,200 feet to 2,500 feet in length. Within the first year, commercial service flights were provided to Montreal, New York City, Cleveland, Newark, Boston, and Springfield. In 1939, the Airport was closed due to unsuitable airport conditions. After improvements, the Airport was opened for daytime use in 1940, and then full time use in 1942. Since its reopening, the airport has had uninterrupted flight service.

The Airport was sold from the City of Albany to Albany County due to financial concerns in 1960. During the span of its new ownership, the Airport received a new passenger terminal building and the north-south runway was extended to 6,000 feet.

In 1993, the ACAA was established to oversee the airport's operations.

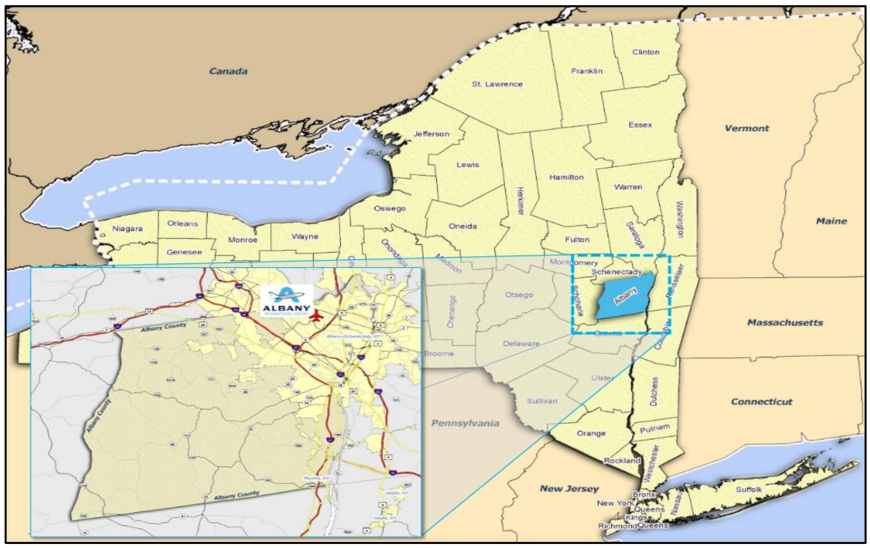
2 Inventory of Existing Conditions

Understanding the background of an airport and the region it serves is essential to making informed decisions pertaining to airport-related improvements. Therefore, to develop a well-rounded understanding of ALB, an inventory of key airport elements was conducted and discussed in the subsequent sections.

2.1 Airport Location

ALB is located within the Town of Colonie, New York encompassing approximately 1,200 acres. The Airport is approximately five miles north of the City of Albany. Albany and Colonie are within Albany County, approximately 135 miles north of New York City (Midtown Manhattan). **Figure 2-1** depicts the location of ALB relative to both the State of New York and the New England region.

Figure 2-1 – Albany International Airport (ALB) Location



2.2 Airport Components

A primary role in the master planning process is to develop a detailed listing of recommended facilities and improvements for implementation over the planning period. As such, the first step in this process is to inventory existing facilities and components and review their current condition.

Airport facilities are often described as either airside or landside, depending upon the type of operation they support. Airside facilities are those related to the landing, takeoff, and taxiing of aircraft in the airfield environment. Examples of airside facilities include: the runway and taxiway system; airfield lighting, marking and visual aids. Landside facilities are those related to the transition from air to ground movement or vice versa. Examples of landside facilities include: the airport terminal building, aircraft refueling area, aircraft storage, and vehicle parking.

Additionally, the airspace surrounding the airport must be inventoried and evaluated. These include various surfaces extending upwards and away from the airport and its runways to ensure the safety of pilots navigating around, towards, and away ALB. Examples of airspace surfaces include approach surfaces, departure surfaces, and FAR Part 77 Surfaces. The purpose of these surfaces is to prevent any obstructions that could be deemed dangerous for aircraft navigation such as trees, cell towers, buildings, etc. Airspace surfaces will be discussed in further detail in later chapters.

2.2.1 Inventory of Airfield Facilities

Airside facilities refer to all areas accessible to aircraft. This includes runways, taxiways, and any additional airfield infrastructure such as navigational aids, lighting, and marking.

2.2.1.1 Runways

The existing airfield configuration at ALB consists of two active runways: Runway 1-19 and Runway 10-28. Runway 1-19 serves as the primary air carrier runway and is 8,500 feet in length and 150 feet in width. Runway 10-28 serves as the secondary runway and is 7,200 feet in length and 150 feet in width.

All runways have published Declared Distances notifying pilots the amount of usable runway length during specific operations: Take-Off Run Available (TORA), Take-Off Distance Available (TODA), Accelerate-to-Stop Distance Available (ASDA), and Landing Distance Available (LDA). Runway 1-19 has the full length of the runway available for all operations. Runway 10 has the full length available for the TORA and TODA, but the ASDA and LDA are limited to 6,780 feet in order to meet safety standards beyond the runway stop end. Runway 28 has full length available for the TORA, TODA, and ASDA, but the LDA is limited to 6,007 feet due to the displaced threshold.

Land and Hold Short Operations (LAHSO) are available to the Air Traffic Control (ATC) for aircraft landings on Runways 1 and 28. LAHSO procedures increase airfield operating capacity without compromising airfield safety by allowing simultaneous operations on both runways, with one landing aircraft restricted to stopping short of the runway intersection while the second aircraft has full use of the other.

<u>Pavement Condition</u>

In 2022, the Airport conducted an Airfield Pavement Management Study to conduct an inventory of all the airfield pavement and recommend pavement rehabilitation projects. Airfield pavement were broken into sections and assigned a Pavement Condition Index (PCI) number to represent the condition of the pavement, ‘0’ being the worst condition and ‘100’ being the best condition.

While sections of pavements were given individual PCIs, an additional Branch PCI was assigned to the networks of Taxiways and Runways as a whole. Runway 10-28 has a Branch PCI of 46 representing “Poor” pavement condition, with individual section PCIs ranging from 34 to 98. Runway 1-19 has a Branch PCI of 67 representing “Fair” pavement condition, with individual section PCIs ranging from 60 to 73. The last rehabilitation project for both runways occurred in 2014.

Table 2-1 – Runway Data

	Runway 1-19		Runway 10-28	
Runway Length (feet)	8,500’		7,200’	
Displaced Threshold (feet)	N/A	N/A	N/A	1,192
Width (feet)	150’		150’	
Runway End Elevation (feet above MSL)	284’	279’	276’	276’
Pavement Type	Asphalt / Grooved		Asphalt/Grooved	
Pavement Load Bearing	400,000 lbs. (Double Tandem)		80,000 lbs. (Double Wheel)	
Effective Runway Gradient	.05%		0%	
Aircraft Approach Category	C		C	
Airplane Design Group	IV		IV	
Runway Markings	Precision		Non-Precision	
Runway and Approach Lighting	HIRL, C/L **Runway 1:** MALSR, PAPI-4, TDZL **Runway 19:** MALSR, PAPI-4, TDZL		MIRL, REIL, C/L **Runway 28:** PAPI-4	
Navigational Aids	ILS/DME, RNAV (GPS, RNP)		VOR/DME, RNAV (GPS)	
Runway Design Code	C-IV-1200	C-IV-2400	C-IV-5000	C-IV-5000
Declared Distances	TORA: 8,500’ TODA: 8,500’ ASDA: 8,500’ LDA: 8,500’	TORA: 8,500’ TODA: 8,500’ ASDA: 8,500’ LDA: 8,500’	TORA: 7,200’ TODA: 7,200’ ASDA: 6,780’ LDA: 6,780’	TORA: 7,200’ TODA: 7,200’ ASDA: 7,200’ LDA: 6,007’

Sources: AirNav.com; FAA Form 5010-1, CHA, 2019.

C/L – Centerline Lights

DME – Distance Measuring Equipment

GPS – Global Positioning System

HIRL – High Intensity Runway Lights

ILS – Instrument Landing System

MALSR Medium-Intensity Approach Lighting System with Runway Alignment Indicator

MIRL – MIRL – Medium-Intensity Runway Lighting

PAPI-4 – Four-Box Precision Approach Path Indicator

PAPI-2 – Two-Box Precision Approach Path Indicator

REIL – Runway End Identifier Lights

RNAV – Area Navigation

RNP – Required Navigational Performance

TDZL – Touchdown Zone Lights

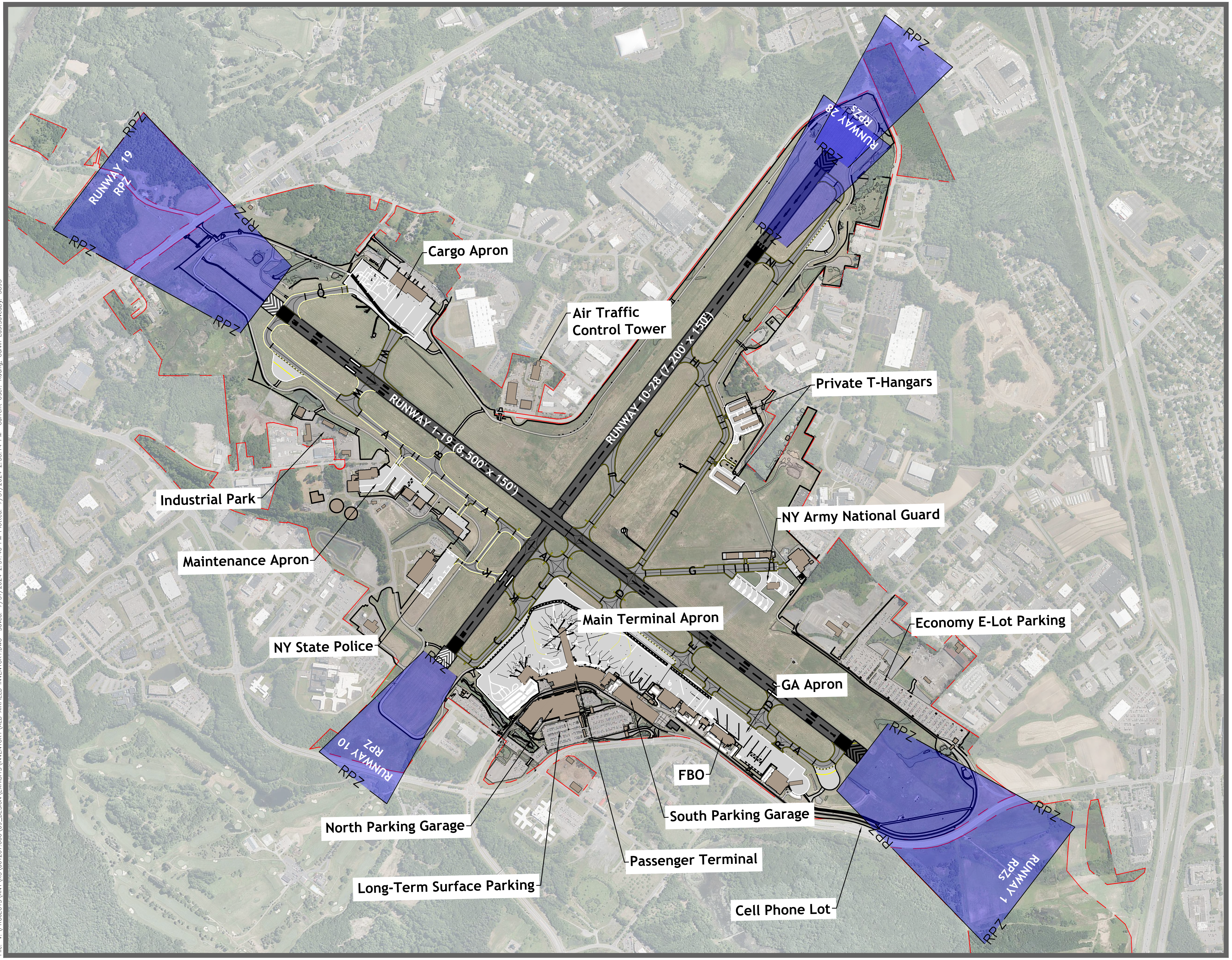
2.2.1.2 Taxiways

An airport's taxiway system connects the runways to aircraft parking aprons, storage hangars, and other facilities. ALB contains 15 named taxiways in its system. **Table 2-2** displays the existing taxiway system at ALB, as well as the specifications of each taxiway. **Figure 2-2** depicts the location of each Taxiway within the airfield.

Table 2-2 – Taxiway Data

Taxiway Name	Description	Width (feet)	Taxiway Design Group (TDG)	Branch PCI	Year Rehabilitated
A	Full parallel providing access to Runway 1-19. Southern portion is adjacent to the Main Apron (Passenger Terminal Building, FBO facilities)	75	5	98	2021
B	Connects RWY 1-19 to TWY 'A'	95	5	83	2021
C	Full parallel providing access to Runway 10-28. Western portion is adjacent to the Main Apron (Passenger Terminal Building)	75	5	45	2014
D	Connects TWY 'A' to RWY 1-19, and RWY 1-19 to TWY 'C'. Provides access to Hangars 'A', 'B', 'C', and 'D'	75	5	37	2021
E	Connects RWY 1-19 to TWY 'A'.	90	5	92	2021
F	Connects RWY 1-19 to TWY 'A'.	90	5	91	2021
G	Provides access to New York Army National Guard Apron	75	5	48	2014
H	Connects RWY 10-28 to TWY 'C'	80	5	52	2011
J	Connects RWY 10-28 to TWY 'C'	75	5	51	2011
K	Connects RWY 10-28 to TWY 'C'	80	5	40	2011
L	Connects GA Apron to TWY 'A'	115	5	99	2021
M	Connects RWY 1-19 to TWY 'A'. Provides access to Cargo Ramp	80	5	65	2021
N	Connects RWY 10-28 to TWY 'C'	85	5	64	2011
P	Connects TWY 'A' to TWY 'K'	50	3	58	2021
Q	Connects RWY 1-19 to Cargo Ramp	80	5	65	2014
R	Connects TWY 'A' to the General Aviation Apron	120	5	98	2021

Source: FAA 5010-1 Form, CHA, 2020; *ALB Airfield Pavement Management Study,* 2022.



ALBANY INTERNATIONAL AIRPORT

ALBANY INTERNATIONAL AIRPORT

MASTER PLAN UPDATE

GRAPHIC SCALE (FEET)

0 550 1100 2200

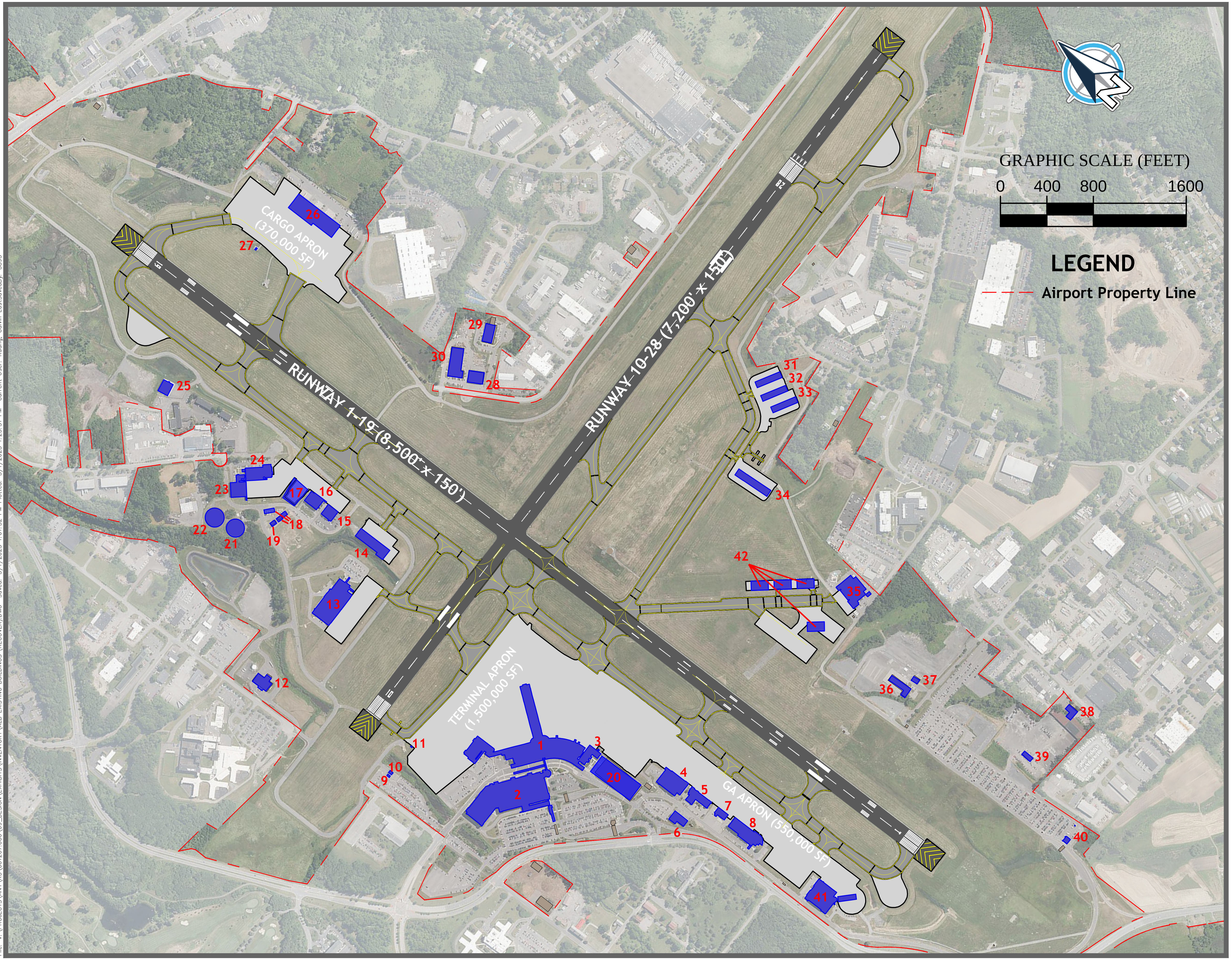
LEGEND

Airport Property Line

Figure 2-2

Existing Airport Layout

ALBANY INTERNATIONAL AIRPORT
MASTER PLAN UPDATE



#	Name of Existing Facility
1	Main Terminal Complex
2	Passenger Parking Garage
3	ACAA Offices
4	FBO Hangar
5	ARFF Facility
6	Sand Storage Building
7	Hangar
8	FBO Offices
9	TSA Storage
10	Triturator
11	Security Checkpoint
12	Fuel Farm
13	NY Police Facility
14	Hangar
15	Hangar
16	Hangar
17	Ground Run-up Enclosure (GRE)
18	Glycol Treatment Facility
19	Storage Facility
20	Parking Garage
21	Glycol Tank
22	Glycol Tank
23	Hangar
24	Hangar
25	Sand Storage Building
26	Air Cargo Facility
27	Air Cargo Glycol Pump Station
28	Vehicle Maintenance Garage
29	Air Traffic Control Tower (ATCT)
30	Airfield Maintenance Offices
31	T-Hangar A
32	T-Hangar B
33	T Hangar C
34	T Hangar D
35	NY Army National Guard Facility
36	ACAA Garage
37	ACAA Offices
38	Rental Car Offices
39	Rental Car Storage
40	Ecomony E-Lot Comfort Station
41	Hangar
42	NY Nat'l Guard Hangars

Figure 2-3
Existing Buildings

2.2.1.3 Navigational Aids

Pilots utilize a variety of navigational aids (NAVAIDs) and instrument procedures using ground-based equipment and/or satellite technology. Examples include Very High Frequency (VHF) Omni Direction Range (VOR), Localizer (LOC), Glideslope, Distance Measuring Equipment (DME), Nondirectional Beacons (NDB), approach lighting systems (ALS), airfield lighting, rotating beacons, and Global Positioning System (GPS) technology. NAVAIDs assist pilots to safely and efficiently locate airports, land and taxi aircraft, and depart from airports during nearly all meteorological conditions.

Instrument Approach Procedures

Instrument Approach Procedures (IAPs) are designed by the FAA to establish airborne routes of ingress and egress to/from the runway environment by providing point-to-point guidance information or position data. IAPs can use either ground-based equipment or GPS technology. There are currently three types of IAPs:

- **Precision Approach (PA):** Precision IAPs provide both vertical and lateral course guidance meeting international precision approach standards (i.e., ICAO Annex 10). Precision IAPs include the Instrument Landing System (ILS), Precision Approach Radar (PAR) approaches, and Ground Based Augmentation Landing System (GLS). Both Runway 1 and 19 are equipped with an ILS.

- **Approach Procedure with Vertical Guidance (APV):** This type of IAP also provides vertical and lateral course guidance but does not meet international requirements for a precision IAP. Area navigation (RNAV) and GPS approaches providing vertical guidance (e.g. Baro-VNAV, LDA with glidepath, LNAV/VNAV and LPV) are considered APV IAPs. Runways 1, 19, and 28 are currently equipped with GPS-based APV approaches.

- **Non-Precision Approach (NPA):** This type of IAP only provides lateral course guidance. Aircraft must accordingly descend at established fixes or distances from the runway. These type of IAPs use either ground-based equipment (e.g., VOR, NDB, LOC) or GPS technology (e.g., lateral navigation [LNAV] or Localizer Performance [LP]). Runways 10 and 28 are equipped with NPA procedures.

Table 2-3 summarizes the Airport's existing IAPs by runway along with the associated NAVAIDs.

Table 2-3 – Navigational Aids

Runway	Runway Markings	Lighting	Instrument Approach Types	Visibility Minimums
1	Precision	MALSR, HIRL, PAPI-4	ILS (Cat I & II) or LOC, RNAV (RNP, GPS)	ILS/LOC – ½ mile ILS SA CAT II – ¼ mile RNAV Z – ¾ mile RNAV Y– ½ mile
19	Precision	MALSR, HIRL, PAPI-4	ILS or LOC, RNAV (RNP, GPS)	ILS/LOC – ½ mile RNAV Z – 1 mile RNAV Y– ½ mile
10	Non-Precision	MIRL, REIL	RNAV (GPS)	RNAV – 1 mile
28	Non-Precision	MIRL, PAPI-4, REIL	RNAV (GPS), VOR	RNAV – 1 ¾ mile VOR – 1 mile

Source: FAA Form 5010-1, CHA, 2019.

Approach Lighting Systems

An Approach Lighting System (ALS) is a lighted approach path along the extended centerline of the runway. During low visibility conditions and at night, an ALS provides aircraft an indication of the runway environment via a series of sequentially flashing lights leading to the runway threshold. Per FAA standards, an ALS is required when an IAP provides a landing visibility minimum of less than ¾ statute mile.

At ALB, Runway 1 and 19 utilize Medium Intensity Approach Lighting Systems (MALS), along with Runway Alignment Indicator Lights (RAILs). Together, these systems form the Medium Intensity Approach Lighting Systems with Runway Alignment Indicator Lights (MALSR). The Runway 1 MALSR equipment currently lacks regular maintenance and is in need of replacement.

MALS

According to FAA Order 6850.2B, *Visual Guidance Lighting Systems*, the MALSR consists of a threshold light bar and seven five-light bars located on the extended runway centerline, the first bar being located 200 feet from the runway threshold, with the remaining bars each at 200-foot intervals out to 1,400 feet from the threshold. One additional five-light bar is located on each side of the centerline bar, 1,000 feet from the runway threshold, to form a 66-foot-long crossbar known as a roll bar. The individual lights in all bars are approximately 2½ feet apart and are aimed into the approach to the runway, away from the runway threshold. All lights in the MALSR system are steady burning white, except for the threshold lights, which have green filters. The threshold lights are a row of lights on 10-foot centers located coincident with and within the runway edge lights near the threshold and extend across the runway threshold.

RAILs

RAILs consist of five sequenced flashers located on the extended runway center line, the first

being located 200 feet beyond the approach end of the MALS with successive units at each 200-foot interval, out to 2,400 feet from the runway threshold. All lights are aimed into the approach to the runway, away from the runway threshold, and flash in sequence toward the threshold at the rate of twice per second.

The resulting combination of the two lighting systems, MALSR, provides visual information to pilots on runway alignment, height perception, roll guidance, and horizontal references for Category I Precision Approaches.

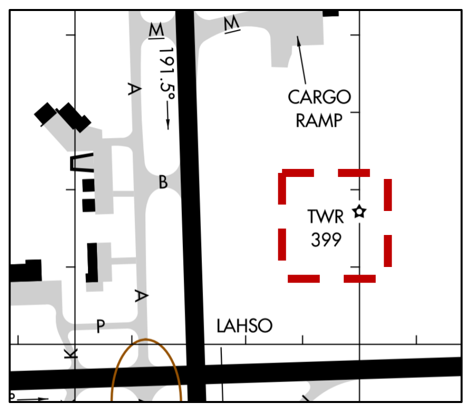
Standard Instrument Departures

Standard Instrument Departure (SID) routes, also known as departure procedures, are published flight procedures followed by aircraft on an IFR flight plan immediately after takeoff from an airport. SIDs provide a common departure procedure that considers terrain and obstacle avoidance, noise abatement (if necessary), and other airspace management considerations.

ALB has one SID for departing IFR aircraft. The SID, identified as *ALBANY SEVEN*, instructs aircraft to maintain runway heading after departure and expect ATC to advise the radar vectors to the assigned departure. Additionally, ALB utilizes Special Take-Off Minimums/Departure Procedures in order to avoid obstacles. As outlined within FAA Advisory Circular 150/5300-13B, evaluation of obstacles within the 40:1 runway Departure Surface may impact design of a SID.

2.2.1.4 Airfield Lighting

In addition to the visual aids previously described, lighting on the airfield includes the rotating beacon, Precision Approach Path Indicator (PAPI) lights, runway threshold lighting, runway edge lighting, Runway End Identifier Lights (REILs), runway centerline lights, Runway Touchdown Zone Lights (TDZLs), taxiway edge lighting and apron lighting. Each of the lighting systems/types are described below.



Rotating Beacon:

The rotating beacon functions as the universal indicator for locating an airport at night or during IFR conditions. For a civilian airport, it has one clear and one green lens 180-degrees apart and is generally visible 10 miles from the airport. The rotating beacon at ALB is located on top of the Air Traffic Control Tower. Location of an airport's rotating beacon is indicated via a start on the airport diagram.

Precision Approach Path Indicator Lights:

Precision Approach Path Indicator Light (PAPI) systems are located near runway ends to provide visual glideslope guidance information during an approach to the runway. PAPI system can consist of either two- or four-light units that are angled to inform aircraft if they are above, below, or on the correct approach glidepath. Glidepath aiming angles for PAPIs can vary based upon terrain and obstacles but are generally less than four-degrees for runways serving turbine aircraft. PAPIs have an effective visual range of at least three miles during the day and up to 20 miles at night. Runways 1, 19, and 28 are equipped with PAPI-4 (four-light unit) systems.

Runway End Identifier Lights:

Runway End Identifier Lights (REILs) are located at the corners of the runway end and consist of a pair of white, unidirectional flashing lights pointed outward into the approach corridor. Similar to an ALS, REILs provide identification of the runway environment during low visibility conditions at nighttime. Both Runway 10 and 28 are equipped with REILs.

Runway Threshold Lighting:

Runway threshold lighting indicates the approach and stop ends of runways at night by emitting green light outward from the runway (approach end) and red light inward toward the runway (stop end). The green lights indicate the landing threshold to arriving aircraft, whereas the red lights indicate the end of the runway for departing aircraft. The red and green lights are usually combined into a single, split lens fixture to emit the desired light in the appropriate direction. For displaced thresholds, the red and green lights are in separate fixtures. The fixtures containing the green lights are positioned at the displaced threshold, while the fixtures containing the red lighting are located in the area before the threshold. At ALB, Runways 1, 19, and 10 have standard runway threshold lighting. Runway 28 has a 1,192-foot displaced threshold; thereby utilizing a displaced threshold lighting system.

Runway Edge Lighting:

Runway edge lighting is white in color and is used to outline the edges of a runway during periods of darkness or restricted visibility. The runway edge lights are positioned parallel to the runway centerline 10 feet from the edge of the full-strength pavement. The spacing of the light units must not exceed 200 feet. These systems are classified according to their intensity, or brightness: High-Intensity Runway Light (HIRL), Medium-Intensity Runway Light (MIRL), and Low-Intensity Runway Light (LIRL). Runway 1-19 is equipped with a HIRL, while Runway 10-28 is equipped with a MIRL system.

Runway Centerline Lights:

Runway centerline lights are required for Category (CAT) II and III precision approach runways, as well as CAT I approaches with Runway Visual Range (RVR) operations less than 2,400 feet. The lighting system consists of embedded lights located along the centerline at 50-foot, equally spaced, longitudinal intervals. The lights are white in color, except for the last 3,000 feet. Between 3,000 feet to 1,000 feet of remaining runway, the centerline lights consist of alternating red and white lights, with the last 1,000 feet being all red. Both Runway 1-19 and 10-28 have runway centerline lights.

Runway Touchdown Zone Lights:

The runway Touchdown Zone Lights (TDZLs) indicate the touchdown zone when landing under low visibility conditions and at night. The TDZLs consist of two rows of white lights beginning 100 feet beyond the landing threshold and extend to 3,000 feet beyond the landing threshold or to the midpoint of the runway, whichever is less. All ALB runways have touchdown point markings, but only Runway 1-19 has TDZLs.

Taxiway Edge Lighting:

Taxiway lighting delineates the taxiway's edge and provides guidance to pilots during periods of low visibility and at night. The most commonly used type of taxiway lighting is a series of blue fixtures, which are sometimes supplemented by blue edge reflectors, set at 200-foot intervals along the taxiway edges, but not more than 10 feet outward from the edge of the full-strength pavement.

2.2.1.5 Aprons

Airport aprons, also referred to as ramps, provide space for short-term and long-term aircraft parking and deicing operations, as well as the loading/unloading of passengers and goods. ALB has six aprons: a terminal apron, a New York State Police apron, a New York Army National Guard apron, a cargo apron, and two general aviation aprons.

Terminal Apron

The terminal apron consists of approximately 1,500,000 square feet of cement/concrete pavement. Activities on the terminal apron primarily include passenger airline and belly cargo loading and unloading.

General Aviation Apron

The General Aviation (GA) apron is contiguous with the terminal apron to the south as delineated by a red "Secured Area" pavement marking. The apron is approximately 550,000 square feet, providing 12 designated tie-downs and additional Remain Overnight (RON) parking for transient aircraft.

Air Cargo Apron

The air cargo-dedicated area, which is shared by FedEx, UPS, and Mobil Air Transport, is serviced by one apron of approximately 370,000 square feet and is located in the northeastern portion of the airfield. The apron provides nine designated aircraft parking spots is used for cargo transfer operations, and aircraft storage and maintenance.

Table 2-4 – Existing Apron Areas

Apron Area		Approximate Size (SF)	Branch PCI	Year Rehabilitated
Terminal Apron	Main Passenger Terminal Complex	1,500,000	65	Unknown
General Aviation Apron	Million Air (FBO) Air Rescue & Fire Fighting Piedmont MRO	550,000	63	2010
Air Cargo Apron	FedEx/UPS/Mobil Air Transport	370,000	61	2011
North GA Apron	CommuteAir MRO Private Tenants	140,000	77	2021
NY State Police Apron	New York State Police Aviation Unit	110,000	52	Unknown

Source: ALB Airport Management, CHA, 2019; ALB Airfield Pavement Management Study, 2022

2.2.2 Landside Inventory

Regional Roadway Access

Access to ALB is provided from and to the south, east, and north via a newly constructed interchange number three with Interstate 87, the Northway. This interchange, which opened in November 2019, provides direct access to Albany-Shaker Road, along which are the Airport entry and exit roadways. Albany-Shaker Road can also be accessed from the west via New York State Route 7.

Curbside Roadways

Two curbside roadways provide passenger unloading and loading space adjacent to the terminal building. The four-lane inner roadway is comprised of a southern portion intended for passenger drop-off activities and a northern portion intended for passenger pickup activities. Commercial vehicles access the two-lane outer roadway via revenue control access gates with AVI equipment.

Public Parking Facilities

Airline passengers park at ALB in either the passenger terminal area or in a remote surface lot, known as Lot E, accessed via Albany-Shaker Road south of the airfield. One off-airport parking facility also exists, known as Colonial Parking. Within the terminal area, short-term parking is provided in the garage, while long-term parking is provided in the surface parking lots south and east of the garage. A second garage east of Airport Terminal Road was recently opened in March 2020. **Table 2-5** shows the capacity and maximum daily rate of the various parking products offered, along with their status as of February 2021, at the time of this inventory. A cell phone lot with approximately 25 spaces is located along northbound Albany-Shaker Road.

Table 2-5 – Public Parking Facilities

Facility	Capacity (spaces)	Maximum Daily Rate	Status as of February 2021
Short-Term	222	$24	Open
Garage	1,912 North 1,000 South	$10	Open
Long-Term	1,278	$6	Closed
Valet	200	Same as long-term	Closed
Lot E	1,432	N/A	Closed

Source: ALB Airport Management, CHA Team, 2021.

Rental Car Facilities

The Airport is served by Avis, Budget, Enterprise, Hertz, National/Alamo, and Dollar rental car companies. Counters are located inside the passenger terminal building with additional kiosks in the ready/return area of the north garage. Customers both pick up and return rental cars on the ground level of the North Garage. Vehicles are serviced on sites located to the north of Runway 10, along Old Albany-Shaker Road.

2.2.3 Passenger Terminal Facilities

Albany International Airport's Passenger Terminal Building is a three-level terminal which currently serves all commercial airlines operating at the Airport. While functioning as a single terminal, the building is composed of three primary components built over separate building campaigns. The oldest portion, Concourse A, was built in 1979 as an addition to the 1959 terminal. The 1959 terminal was replaced by the current Terminal Building in 1998 and its associated Concourse B. The facility was expanded two years later in 2000 with expansion of Concourse C. Passenger and baggage processing is located on Level 1 along with back-of-house and apron support. Level 2 contains security and the airside concourse (and access to the level 1 ground-load gates). Airport offices and a public observation deck are located on Level 3. A breakdown of the terminal areas is summarized in **Table 2-6.** The floorplans of each terminal level are depicted **Figure 2-5**, **Figure** 2-6, and **Figure** 2-7.

Figure 2-4 – Albany International Airport Terminal Components

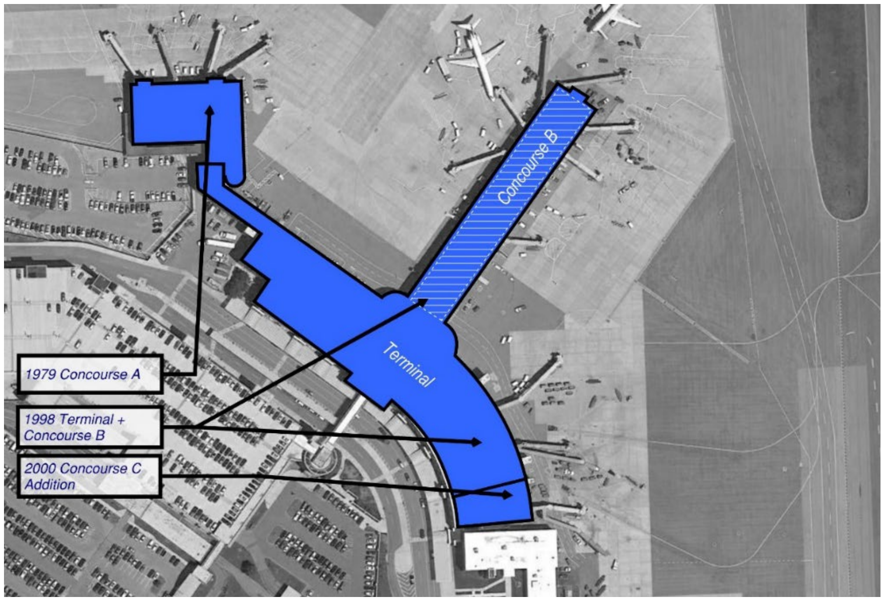
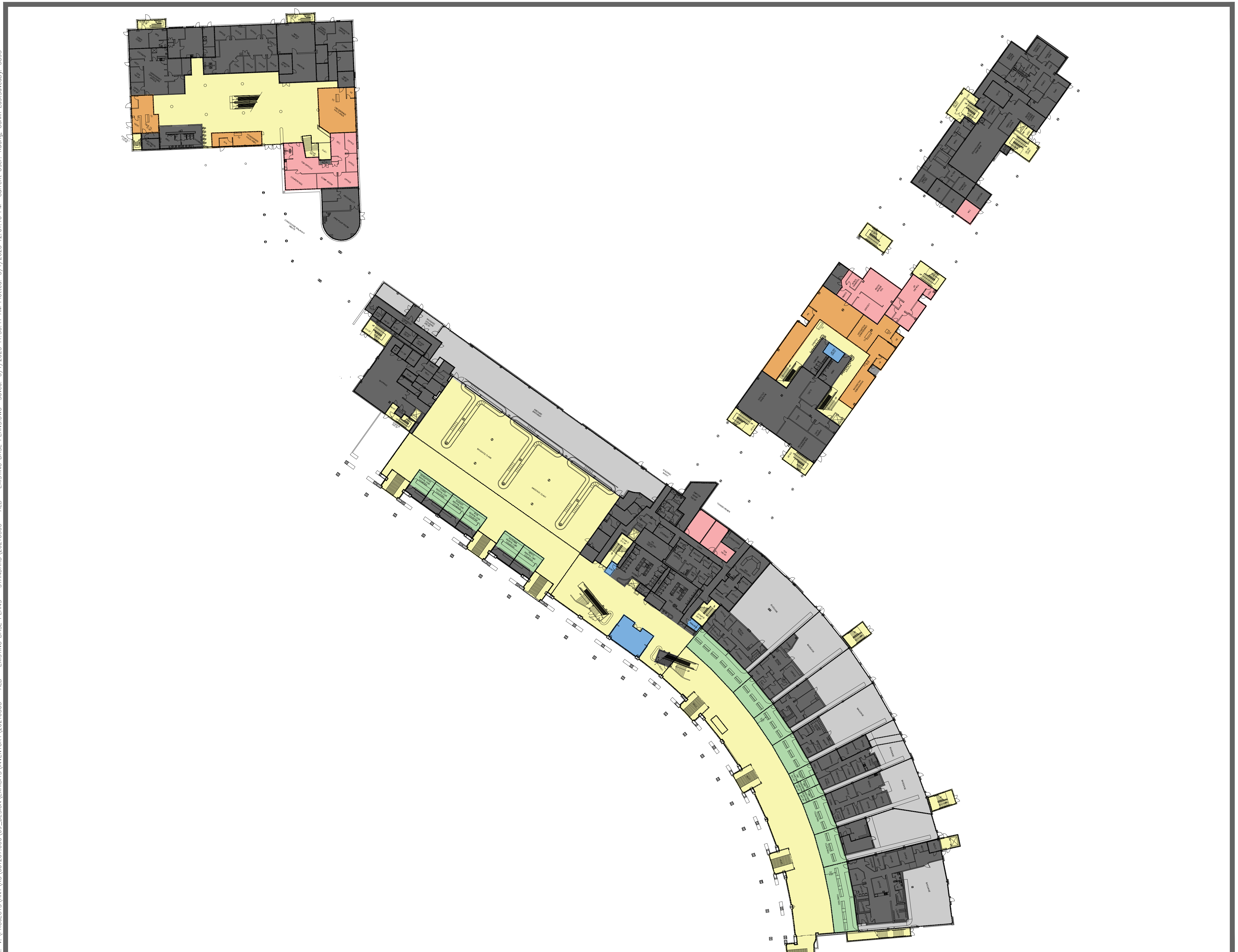


Table 2-6 – Terminal Program Areas (rounded to nearest hundred)

	Arrivals Level	Departures Level	Mezzanine Level	*TOTAL*
Airport Ops	8,700sf	1,000sf	3,300sf	***13,000sf***
Airline Ops	20,400sf	---	---	***20,400sf***
Other Ops	1,800sf	---	300sf	***2,100sf***
Support416 + MEP	17,900sf	16,000sf	5,200sf	***39,100sf***
Inbound Ba1ggage	7,600sf	---	---	***7,600sf***
Baggage Makeup	15,400sf	---	---	***15,400sf***
Baggage Claim	10,600sf	---	---	***10,600sf***
Circulation	35,200sf	17,300sf	8,600sf	***61,100sf***
Restrooms	3,900sf	6,400sf	800sf	***11,100sf***
Concessions	1,100	24,800sf	---	***25,900sf***
Ticketing	6,100sf	---	---	***6,100sf***
Security Screening	6,000sf	4,100sf	1,000sf	***11,100sf***
Holdrooms	6,200sf	23,700sf	---	***29,900sf***
TOTAL	***140,900sf***	***93,300sf***	***19,200sf***	***253,400sf***



ALBANY INTERNATIONAL AIRPORT

MASTER PLAN UPDATE

GRAPHIC SCALE (FEET)

0 40 80 160

LEGEND

- Operations - Airport
- Operations - Airlines*
- Operations - Other
- Support / BoH / MEP
- Inbound Baggage
- Baggage Makeup
- Baggage Claim
- Circulation
- Restrooms
- Concessions
- Ticketing
- Security Screening
- Holdroom

Figure 2-5

Existing Terminal Level 1

ALBANY INTERNATIONAL AIRPORT

MASTER PLAN UPDATE

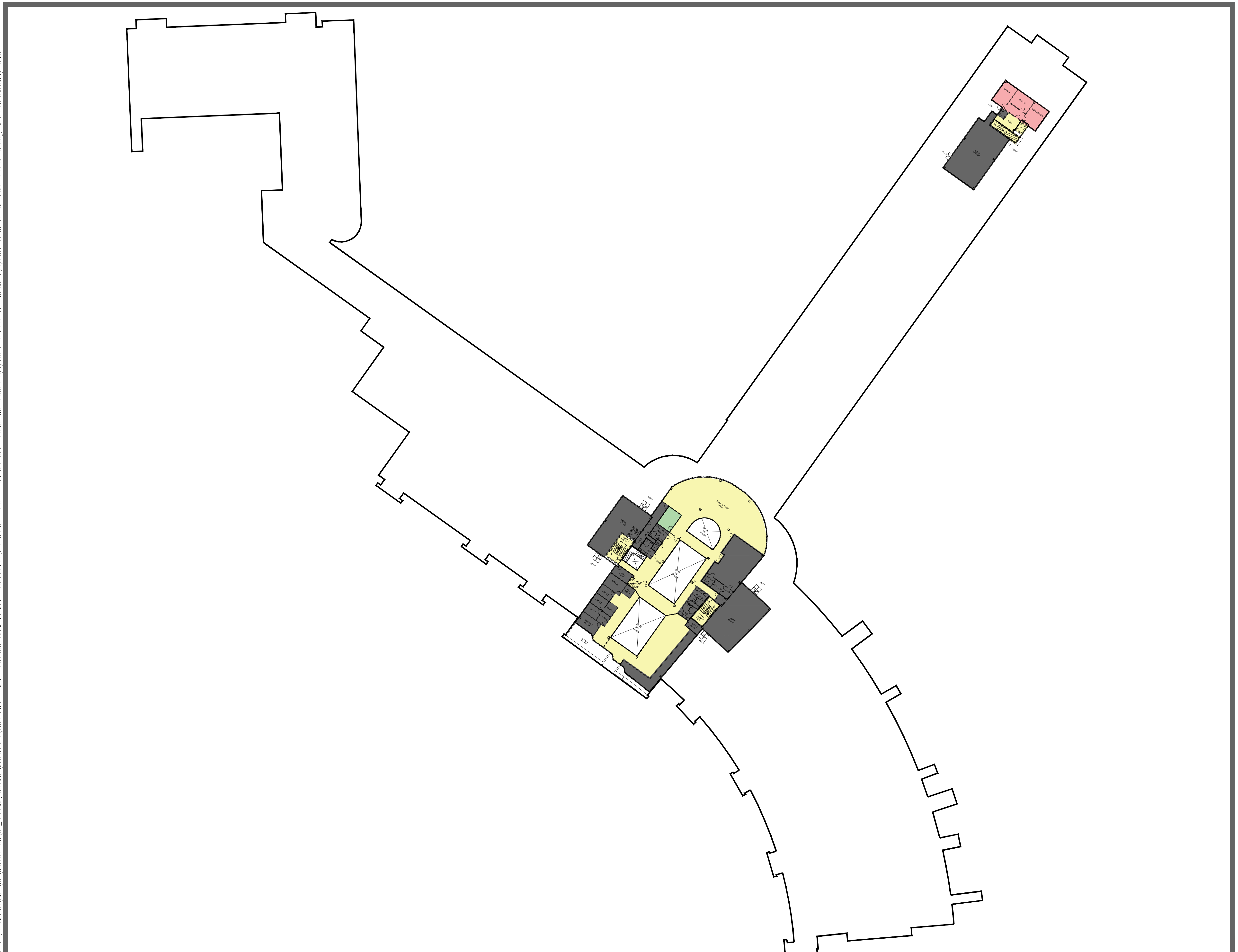
GRAPHIC SCALE (FEET)

0 40 80 160

LEGEND

- Operations - Airport
- Operations - Airlines*
- Operations - Other
- Support / BoH / MEP
- Inbound Baggage
- Baggage Makeup
- Baggage Claim
- Circulation
- Restrooms
- Concessions
- Ticketing
- Security Screening
- Holdroom

Figure 2-6
Existing Terminal Level 2



ALBANY INTERNATIONAL AIRPORT

ALBANY INTERNATIONAL AIRPORT

MASTER PLAN UPDATE

GRAPHIC SCALE (FEET)

0 40 80 160

LEGEND

- Operations - Airport
- Operations - Airlines*
- Operations - Other
- Support / BoH / MEP
- Inbound Baggage
- Baggage Makeup
- Baggage Claim
- Circulation
- Restrooms
- Concessions
- Ticketing
- Security Screening
- Holdroom

Figure 2-7
Existing Terminal Level 3

Passenger Check-In Area

The Passenger Check-In Hall is located on the eastern end of Level 1 and consists of 60 check-in positions at 30 podiums. Baggage take-away belts run along the back wall parallel to and behind the podium line. The banks of six podium positions on either end are each served by a single belt while the remaining 18 podiums have six belts serving three podiums each. Airline offices are located behind their respective podiums with their bag screening and make-up areas beyond. Each take-way belt leads directly to an in-line screening device serving that line. Currently, there is no ability to divert bags from one line to another to provide redundancy during maintenance or downtimes.

Figure 2-8 – Check-In Hall Looking East

The center of the building contains the elevators, escalators, and stairs which lead to/from security and the airside gates on Level 2 above. The eastern escalators and stair are situated opposite the three westernmost check-in podiums (currently American Airlines). This creates a significant circulation constraint and results in crowding situations during peak times. A small concession unit is provided along the exterior wall (currently housing the Mario and Matilda Cuomo Pavilion) with male and female public restrooms (each with 13 fixtures) accessed at the back wall.

Baggage Claim Area

The double-height Meeter/Greeter Hall and adjacent single level Baggage Claim Hall are located at the western end of the Level 1 processor. Baggage Claim provides three flat-plate thru-wall devices with 130-foot presentation length each. Rental car counters line the exterior wall sitting between the three vestibules while Bag Services Offices are situated on either side of the hall. During tenant interviews it was noted that these offices are undersized for their current functions. The depth of the hall is approximately 90-feet from back wall to face of the rental car counters. While glass walls within the tenant spaces do allow for some visibility, the Rental Car Counters obstruct views between curbside and the interior, resulting in a potential reliance on signage for wayfinding rather than direct lines of sight to the curb providing intuitive wayfinding.

Figure 2-9 – Baggage Claim Hall Looking West

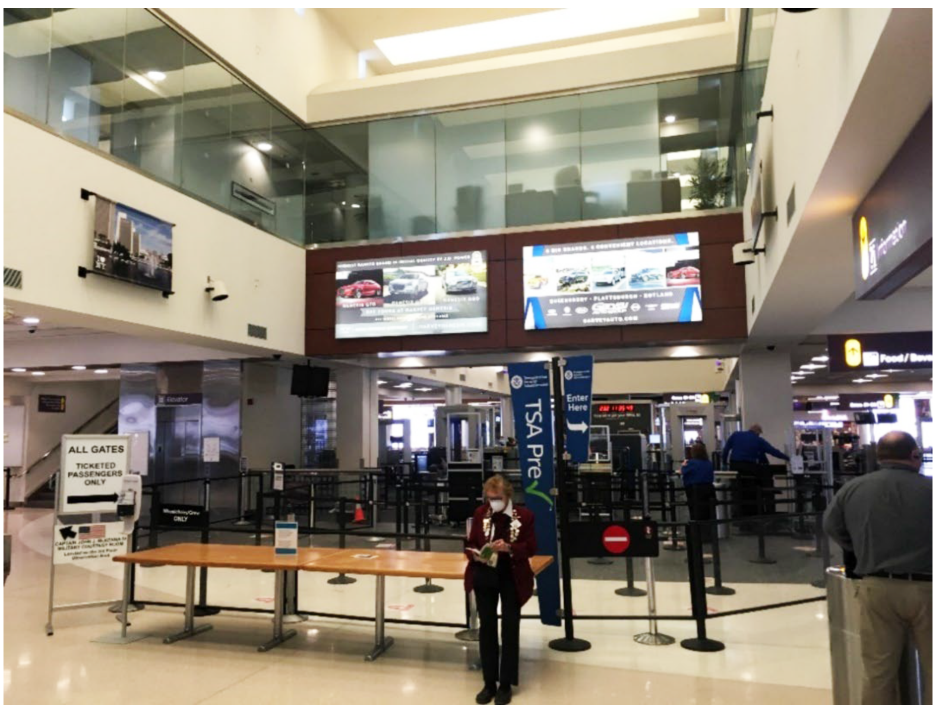
To the west of Baggage Claim, beyond the Baggage Services Offices is the loading dock and servicing areas. The dock has two uncovered bays leading directly to a receiving area and service elevator.

Passenger access to Level 2 airside is through the central Security Screening Checkpoint. With escalators and stairs leading to/from both Check-In and Baggage Claim, to the Meeter/Greeter area on the left side of the Checkpoint. This small pre-security zone is a balcony or mezzanine overlooking the two halls below. This area also connects directly to the parking garage via a bridge, the entrance to which is framed by two concession units. While their location at the top of the escalator/stair pairs and at the entrance to the bridge provides visibility and footfall, this concentration of flows creates a potential moment of crowding and obstruction. In addition, at peak overflow times, flows may conflict as passengers entering from the garage make their way to the escalators to reach the Check-In Hall below.

Security Checkpoint

The 6-lane Security Screening Checkpoint is situated on Level 2 at the center of the terminal and leads directly to the majority of gates. While this location reduces average walking distances and eases wayfinding, the checkpoint does have several significant concerns. The Checkpoint is bounded to the east and west by vertical circulation and mechanical cores which may inhibit checkpoint growth. To the south, the balcony offers minimal queue area resulting in overflow down the escalators to Level 1 below. These factors may impact the overall future resiliency of this space should additional lanes or larger equipment be required. The Airport is currently advancing a terminal expansion project that will address the Level 2 space constraints and will be discussed in more detail in the Alternative Development chapter.

Figure 2-10 – Presecurity Looking Towards Checkpoint



Terminal Concourses

The entirety of the sterile passenger terminal facility is located on Level 2. To either side of the security checkpoint is a continuous band of concessions and support spaces which run along the entire length of the Terminal. This sits between the double-height spaces along landside and the continuous band of holdrooms and circulation that run along the airside façade. To each side of the checkpoint, continuous service corridors provide access to back-of-house spaces (MEP and support) and concession units. The eastern band contains the holdrooms serving the three contact C-Gates. The western band provides a public circulation zone used to access Concourse A. Two banks of male and female restrooms are located on either side of security.

Concourse B sits perpendicular to the landside portions of the terminal and is axially aligned with the security checkpoint. At the base of the concourse, directly opposite the checkpoint, is a recently renovated marketplace area including concessions and general purpose seating. This arrangement provides those concessions with maximum exposure through the 100% footfall generated by all passengers entering airside at this one location. From this one spot, wayfinding is simplified by three primary choices: A-Gates, B-Gates, or C-Gates. However, this simplicity is the result of the location of security to the south of the circulation zone and might be impacted should security be expanded to the north. This location experiences congestion during peak passenger activity.

The concourse is laid-out in a traditional double-loaded fashion, with a central circulation zone and gates and concessions/support lining either side. Seven contact gates are clustered around the end of the pier. Additional gate capacity is provided by the ground-load holdrooms accessed via vertical circulation to either side at the neck of the concourse. Restrooms are located between the contact and ground-load holdrooms with male and female facilities. Additional public restrooms are located in the ground-load holdrooms.

Concourse A is located at the western end of the terminal and is accessed via an airside circulation zone. The concourse has four contact gates accessed from a consolidated holdroom area. Between the holdroom and the circulation to Concourse B are two concession units, one located adjacent to the holdroom area and another at the entrance to the connector to B. A restroom block provides five fixtures each for men and women.

Miscellaneous Terminal Facilities

At the center of the terminal, located above the security checkpoint, a small Level 3 area provides offices for the Airport as well as a public observation area. Open wells at this level, offer views to Level 2 below. Two public restroom blocks (each with a male and female restroom) provide a total of four female fixtures and five male fixtures. An additional small penthouse area above the end of Concourse B contains MEP as well as a small TSA office space. Additional TSA offices, support, and ground-load holdrooms are located throughout Level 1: below Concourse B, at the center of the Terminal Building, and below Concourse A in two separate locations.

2.2.4 Inventory of Support Facilities

Support facilities provide vital functions related to the overall operation of the Airport, and typically include facilities related to: air cargo, GA/FBO, aircraft refueling and deicing, aircraft rescue and fire fighting (ARFF), and airfield maintenance.

Air Cargo Facilities

The cargo ramp is located on the northeast quadrant of the airfield. The 370,000 square foot apron and 70,000 square foot sorting facility are shared by FedEx, UPS, and Mobil Air Transport.

General Aviation Facilities

Million Air is ALB's sole Fixed Based Operator, operating from their terminal complex on the GA apron located in the Southwest quadrant of the airport. Additionally, they operate three hangars: two on the GA apron and one in the Northwest quadrant.

The Albany County Airport Authority (ACAA) manages 4 T-Hangar facilities equipped with self-serve AvGas on the Southeast quadrant of the airfield

Hangars

The Airport consists of 17 hangars spread amongst the Southwest, Northwest, and Southeast quadrants. **Table 2-7** shows each hangar (identified by its building number in **Figure 2-3** – Existing Buildings) and its current condition. Hangar maintenance, rehabilitation, and/or replacement will be discussed further in the Facility Requirements chapter.

Table 2-7 – Hangars

Building No.	Description	Size (approx.)	Condition
109	FBO Hangar	20,000 SF	Good
112	FBO Hangar	23,000 SF	Fair
119	MRO Hangar	30,000 SF	Good
200	NYSP Hangar	40,000 SF	Good
201	4 Bay Hangar	20,000 SF	Fair
202	Private Hangar	8,000 SF	Good
203	Private Hangar	10,000 SF	Good
211	MRO Hangar	15,000 SF	Fair
222	MRO Hangar	16,000 SF	Good
400	10-Bay Nested T-Hangar	11,000 SF	Good
401	10-Bay Nested T-Hangar	11,000 SF	Good
402	10-Bay Nested T-Hangar	11,000 SF	Good
403	11-Bay Nested T-Hangar	19,000 SF	Good
413	NY ARNG Hangar	14,000 SF	Fair
414	NY ARNG Hangar	12,000 SF	Good
415	NY ARNG Hangar	12,000 SF	Good
416	NY ARNG Hangar	12,000 SF	Good
417	NY ARNG Hangar	12,000 SF	Good

Source: CHA, 2023.

Aircraft Refueling Stations

Million Air is responsible for fuel services at ALB via the fuel farm located in the Northwest quadrant of the airfield. Both Jet-A and Avgas fuel is stored in one of the nine tanks with a total capacity of approximately 400,000 gallons.

Aircraft Deicing and Glycol Facilities

Million Air is responsible for deicing services at ALB using glycol. A treatment plant is located on the northwest quadrant of the airport and consists of two glycol storage tanks with a combined capacity of 6 million gallons.

Ground Run-up Enclosure (GRE) Facility

A GRE is located on the northwest quadrant of the airfield and is available for public use. Aircraft ground run-ups are conducted to test aircraft engine as part of regular maintenance,. A GRE facility reduces the amount of noise emissions from ground run-up operations. The facility can accommodate aircraft with up to ADG III wingspan (i.e. 118 feet wingspan).

Aircraft Maintenance, Repair, and Overhaul (MRO) Facilities

Three airlines operate MRO facilities at ALB. Piedmont has a 40,000 square foot hangar in the southwest quadrant capable of servicing their current regional jet fleet of Embraer ERJ-145. CommuteAir has a combined 47,000 square foot facility in the northwest quadrant capable of servicing their current regional jet fleet of Embraer ERJ-145. Cape Air operates in a portion of a 28,000 SF hangar located in the northwest quadrant servicing their current fleet of Cessna 402 and Tecnam P2012 Traveller.

Aircraft Rescue and Fire Fighting Facilities

ARFF vehicles are designed to provide an invaluable service to the commercial and private users of the Airport and the passengers and cargo they transport to ensure continuous safety of passengers, pilots, and ground crew. The requirements of ARFF equipment and facilities for a specific airport are determined using the metrics described in Title 14 CFR Part 139.315, *Aircraft Rescue and Firefighting: Index Determination*. ALB operates as an ARFF Index E, which exceeds the requirements based on daily operations due to its role as a dedicated diversion airport for John F Kennedy International Airport located in New York City. Currently, the ARFF facility is equipped with three 3,000 gallon capacity airfield firefighting trucks and additional utility vehicles for firefighting on landside facilities (i.e. passenger vehicle parking garages).

The ARFF facility is located in the Southwest quadrant on the GA Apron.

Table 2-8 – ALB ARFF Equipment

Firefighting	Support
2009 Rosenbauer 6x6 Panther (3,000 gallon)	2015 Chevrolet Pickup Truck
2011 Rosenbauer 6x6 Panther (3,000 gallon)	2019 Polaris ATV
2014 Rosenbauer 6x6 Panther (3,000 gallon)	2022 Chevrolet Tahoe
2009 Pumper	(2) 14’ Utility Trailers

Airfield Maintenance Facilities

Maintaining the airfield to ensure safe and continuous use is of utmost importance. ALB has a dedicated airfield maintenance building and garage located in the Northeast quadrant adjacent to the Control Tower. Additional storage facilities for vehicles and sand (for winter conditions) can be found in the Southwest and Northwest quadrant.

2.3 Inventory of Operations, Airspace, and ATCT Procedures

In addition to facilities, the Master Plan accounts for how the airport is operated and used in order to better understand and address any areas of concern that will ultimately guide the design and development of the future alternatives.

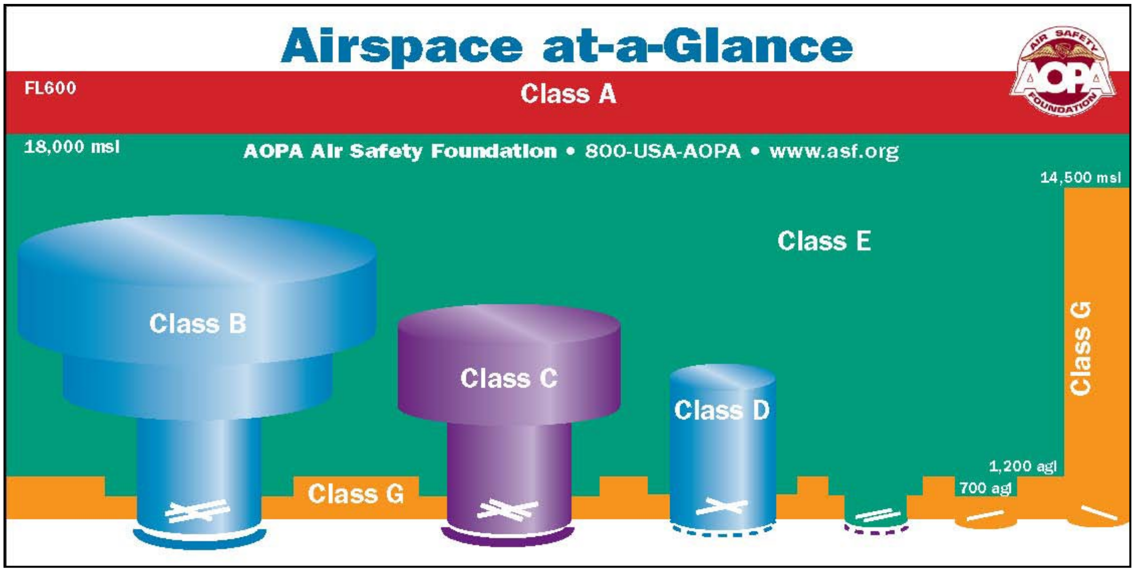
2.3.1 Airspace and Air Traffic Control

There are two types of aircraft flight operations in the National Airspace System (NAS): Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). VFR operations rely on pilots maintaining visual separation from aircraft and objects and require minimum weather conditions for operation. Conversely, IFR operations rely on radar detection, instrument navigation, and separation by Air Traffic Control (ATC). IFR flights permit operations below VFR weather minimums (i.e., during IMC). As discussed above, Runways 6-24 and 29 all have published instrument procedures to enable approached and landings during IMC.

The NAS classifies airspace uses a lettering-system (e.g., Class A, B, C, D, E, and G) and includes controlled and uncontrolled areas of airspace. Class A airspace is a controlled airspace and is generally reserved for business and commercial aircraft as it begins at 18,000 feet above Mean Seal Level (MSL). Class A airspace requires operation under IFR flight plan and communication with ATC. The Class B, C, and D airspaces are also considered controlled airspace and are generally centered about larger airports. Communication with ATC must be established prior to entering the Class B, C, or D airspaces. The Class E and G airspaces encompass the majority of the NAS’s airspace below 18,000 feet MSL. Class E airspace can be either controlled or uncontrolled, depending on the type of operation (i.e., VFR or IFR). Class G airspace is always uncontrolled.

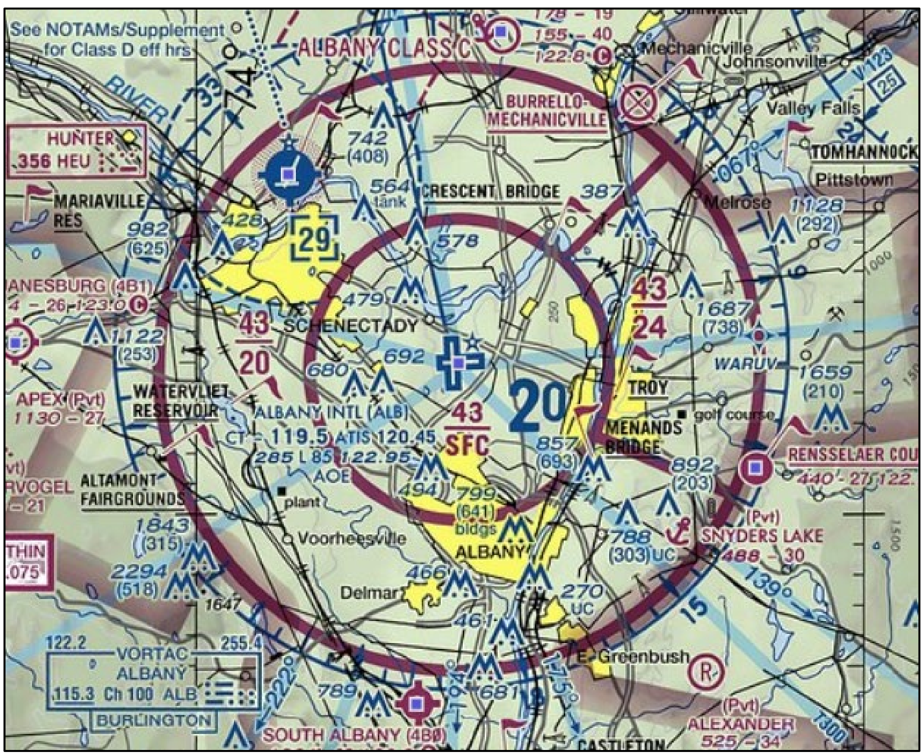
ALB is a towered airport located within Class C airspace.

Figure 2-11 – National Airspace System



Source: FAA Aeronautical Information Manual.

Figure 2-12 – ALB Airspace



Source: FAA Sectional Aeronautical Chart.

2.3.2 Air Traffic and Passenger Activity

An aircraft operation is defined as either a landing or a takeoff. Thus, each flight includes at least two operations; one takeoff and one landing. According to data provided by the Air Traffic Control Tower, there were approximately 75,000 annual operations at ALB in 2019, which amounts to an average of 100 landings per day. Of that total, itinerant and local operations were approximately split 80-20 respectively. Local flights are conducted mostly by based aircraft, and primarily include single- and multi-engine piston aircraft conducting training and recreational flights. Itinerant operations (i.e., those arriving from outside of the local area) are conducted by a mix of based and transient or visiting aircraft, namely from commercial service.

Passenger enplanements is defined as a boarding of an aircraft by a revenue passenger for a commercial service flight, air taxi flight, or private charter flight. According to the FAA Terminal Area Forecast, ALB has a total of approximately 1,500,000 enplanements.

2.3.3 Airfield Use

Wind Data

A factor influencing the infrastructure requirements on airfield are the local weather conditions and their effect on both airport operations and capacity. Wind conditions affect all airplanes in varying degrees, generally the smaller the airplane, the more affected its operations are by wind, particularly crosswind components. As such, crosswind components of airfields are evaluated based on FAA guidelines of 10.5, 13, 16, and 20 knots, considering the aircraft types and each individual runway.

Based on the aircraft types and their corresponding Runway Design Code operating at ALB (see **Table 2-12**), the following crosswind components are applicable (per FAA Advisory Circular 150/5300-13B):

- Light single and twin-engine (A/B-I) = 10.5 knots
- Turboprop aircraft and light jets (A/ B-II) = 13 knots
- Corporate & Regional Jets (A/B-III, C/D-I thru C/D-III) = 16 knots
- Commercial Jets (all AAC E and all ADG IV) = 20 knots

Furthermore, wind data is evaluated under All Weather (AW), Visual Flight Rules (VFR), and Instrument Flight Rules (IFR) conditions. Per FAA, for a runway to have adequate wind coverage, it must have a 95% wind coverage for the aircraft accommodated. Should a runway fall below 95%, a crosswind runway may be necessary for safety of operations at the airport.

This study utilizes weather observations for the period of 2010 to 2019 recorded by the Automated Weather Observing Station (AWOS) and are the basis of the wind rose analysis. **Table 2-10** lists the wind coverage for the runways at ALB. Both runways provide similar coverage, providing the desired wind coverage of 16 knots for the large commercial jet aircraft operating at ALB. As shown in the table, both runways provide 99.6% all-weather wind coverage for a 16-knot crosswind component.

Runway 1-19 provides slightly better wind coverage during fair weather or VFR conditions, and during inclement or poor weather conditions Runway 10-28 is the preferred runway from a wind standpoint.

Table 2-9 – Wind Data

	Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
AW	1-19	90.26%	94.16%	97.80%	99.50%
	10-28	90.40%	94.49%	98.07%	99.48%
	All Combined	96.70%	98.76%	99.64%	99.93%
VFR	1-19	89.15%	94.40%	98.57%	99.68%
	10-28	90.24%	94.34%	98.09%	99.54%
	VFR Combined	96.76%	98.87%	99.72%	99.96%
IFR	1-19	87.36%	92.21%	96.35%	98.84
	10-28	91.17%	95.22%	98.05%	99.25%
	IFR Combined	96.56%	98.36%	99.29%	99.80%

Source: NOAA National Climatic Data Center (Albany International Airport 2010-2019), CHA, 2020.

2.3.3.1 Runway Designations

The FAA classifies each airport runway as either primary, crosswind, secondary, or additional as per the ***Airport Improvement Program (AIP) Handbook***, FAA Order 5100.38D. All but 'additional' runways are eligible for FAA funding.

Table 2-10 – Primary Runway Determination Factors

Potential Primary Runway Criteria	Runway 1-19	Runway 10-28
Runway Length	8,500'	7,200'
Runway Width	150'	150'
Runway Utilization*	49% estimated	51% estimated
Approach Capabilities	ILS (1/2 mile – 200' DH)	RNAV LPV (1 3/4 mile, 400' MDA)
Hourly Capacity	XX	XX
Proximity to Facilities	Good	Good

*Based on wind data.

The above data are used in the primary runway determination; however, the FAA does not provide a specific formula or rubric to identify the primary vs crosswind or secondary runway.

- **Runway 1-19** provides a longer length and the only ILS.

- **Runway 10-28** provides slightly better crosswind coverage during IFR conditions.

While all runways provide the necessary $\geq$95% wind coverage for the larger Group C commercial aircraft, only Runway 10-28 provides the 95% wind coverage for smaller Group A and B general aviation aircraft. As such, per FAA Order 5100.38D, a crosswind runway is justified to serve the lighter aircraft.

It is noted that while Runway 1-19 has a slightly lower runway usage from a wind perspective, the longer length combined with the available ILS designated it as the primary runway; with Runway 10-28 as the crosswind runway.

Table 2-11 – ALB Current Runway Designation

Runway	Classification
Runway 1-19	Primary
Runway 10-28	Crosswind

2.3.3.2 Runway classification by aircraft category

The FAA uses a classification system, known as the Airport Reference Code (ARC), to signify the airport's highest Runway Design Code (RDC), the design standards to which the runway is to be built. RDC consists of three components:

- aircraft approach speed (AAC),
- airplane design group (ADG) relating to either the aircraft wingspan or tail height (whichever is more restrictive), and
- visibility minimums.

The overall ARC is determined by taking the highest RDC minus the visibility component. ARC affects runway and taxiway dimensions, separation standards, pavement marking standards, and other safety standards. Furthermore, it is used for airport planning and design but does not limit the aircraft that may be able to operate safely at the airport. The relationship between the ARC and design standards is further detailed in FAA AC 150/5300-13B, *Airport Design* and summarized in **Table 2-12**. Based on the FAA Traffic Flow Management System Count (TFMSC) Data and airport flight schedule, ALB is currently designated with an ARC C-IV, with over 1,500 annual Boeing 757 operations. Consequently, ALB falls under the standards outlined for RDC C-IV-1200 on Runway 1/19 and C-IV-5000 on Runway 10/28.

Table 2-12 – FAA Airport Reference Code Classification

Approach Categories			
Approach Category	**Airspeed (Knots)**		**Example Aircraft**
A	<91		Cessna 152
B	91 ≤ 121		Citation X
C	121 ≤ 141		Gulfstream 450
D	141 ≤ 166		Boeing 757
E	166+		B-2 Spirit
Airplane Design Group			
Design Group	**Tail Height (feet)**	**Wingspan (feet)**	**Example Aircraft**
I	<20	<49	Piper Cherokee
II	20-<30	49 ≤ 79	King Air B250
III	30-<45	79 ≤ 118	Gulfstream 550
IV	45-<60	118 ≤ 171	Boeing 757
V	60-<66	171 ≤ 214	Boeing 747
VI	66-<80	214 ≤ 262	Airbus A380
Visibility Minimums			
RVR	**Instrument Flight Visibility Category (statute mile)**		
5000	Not lower than 1 mile		
4000	Lower than 1 mile but not lower than ¾ mile		
2400	Lower than ¾ mile but not lower than ½ mile		
1600	Lower than ½ mile but not lower than ¼ mile		
1200	Lower than ¼ mile		

Source: FAA AC 150/5300-13B *Airport Design*, CHA, 2019.

3 Forecast

3.1 Introduction

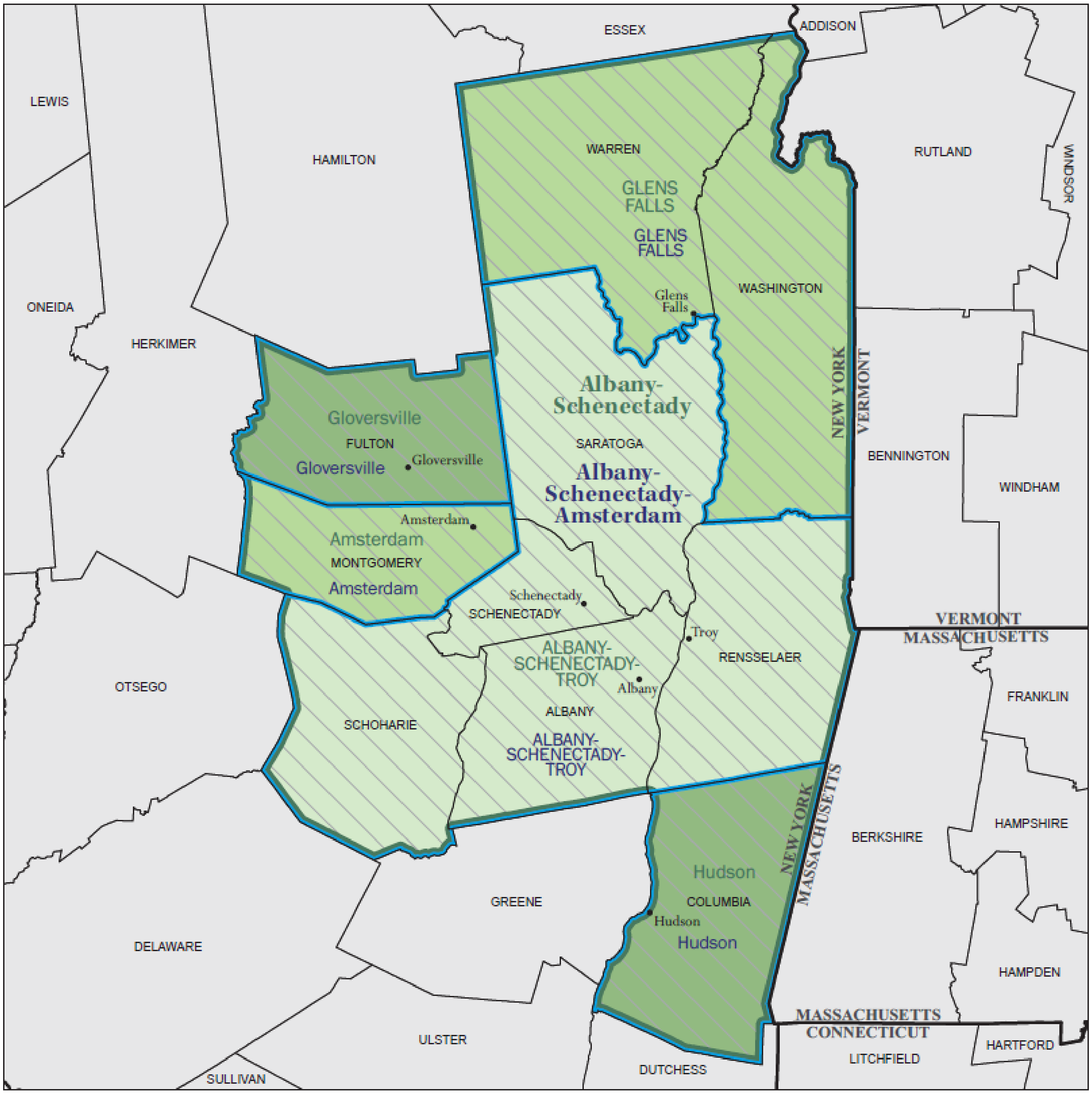
This report describes the forecasts of future aviation demand at Albany International Airport (ALB or the Airport) that will be used to guide the Master Plan Update (Master Plan) process. Activity forecasts represent critical inputs to the Master Plan as they are used to determine the required level of airport facility development needed to accommodate expected levels of future demand. The forecasts for this Master Plan have been prepared using a base year of 2021 and cover a 20-year planning horizon (2021 to 2041). They represent an independent evaluation of future activity at ALB and use the most recent available data at the time of the forecast development.

Key aviation activities measured in the forecast include airline passenger enplanements, commercial aircraft operations (air carrier, commuter/air taxi, all-cargo), general aviation (GA) operations, military operations, and projections of based aircraft.

3.2 Airport Service Area

A review of historical and projected socioeconomic data for the Airport's air service area is a key step in the development of the aviation demand forecast. The air service area is the geographic area from which the Airport draws the majority of its passengers. The Albany International Airport air service area is defined for this report as the Albany-Schenectady Combined Statistical Area (Albany CSA or CSA). The CSA according to the US Office of Management and Budget includes the counties of Albany, Columbia, Fulton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, Warren, and Washington counties in New York State. The CSA includes the major cities of Albany, Schenectady, Troy, and Saratoga Springs. **Figure 3-1** shows the counties within the CSA along with the location of Albany International Airport. When socioeconomic data for the CSA was not available data for the Albany-Schenectady-Troy Metropolitan Statistical Area (Albany MSA) was substituted. The Albany MSA includes the counties of Albany, Rensselaer, Saratoga, Schenectady, and Schoharie in New York State (Figure 1 light green area) and accounts for approximately 75.0% of the total population of the Albany CSA.

Figure 3-1 Albany-Schenectady CSA Statistical Area Map



Source: U.S. Census Bureau, www.census.gov, accessed June 2022

3.3 Socioeconomic Indicators

The following sections provide an overview of the key socioeconomic variables of the air service area that typically drive aviation demand including population, non-farm employment, personal income, and gross domestic product (GDP). The most recent available historical and forecast statistics are provided below for these key socioeconomic variables for the CSA or MSA, New York State and the U.S.

3.3.1 Population

Population growth in the Albany CSA from 2010 to 2021 occurred at an average rate of 0.03% per year which was below the average rates for New York State of 0.2% per year and the U.S. of 0.5% per year, according to the U.S. Census Bureau. Based on forecast data from Woods & Poole Economics, Inc. (Woods & Poole), for the period 2021 to 2041 population in the CSA is projected to grow at an average rate 0.2% per year compared to 0.1% for New York State and 0.6% for the U.S. **Table 3-1** depicts the population growth (see **Table 3-1**).

3.3.2 Employment

Non-farm employment in the CSA grew at a rate of 0.8% per year from 2010 to 2021 compared to growth of 1.5% per year for New York State and 1.6% for the U.S. according to data from the U.S. Bureau of Labor Statistics. Based on employment growth projections from Woods & Poole, non-farm employment in the CSA for the period 2021 to 2041 is projected to increase at a rate of 0.6% per year compared to 1.0% per year for New York State and 1.1% for the U.S. **Table 3-1** depicts the employment growth.

3.3.3 Income

Per Capita Personal Income (PCPI) in the CSA grew at a rate of 2.3% per year from 2010 to 2021 compared to growth of 2.2% per year for New York State and 2.1% for the U.S. according to data from the U.S. Bureau of Economic Analysis. Based on PCPI growth projections from Woods & Poole, PCPI in the CSA for the period 2021 to 2041 is projected to increase at a rate of 1.5% per year compared to 2.0% per year for New York State and 1.6% for the U.S. **Table 3-1** depicts the income growth.

Table 3-1 – Historical and Projected Socioeconomic Data

	Population			Non-Farm Employment			Per Capita Personal Income (2012 dollars)		
Historical	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States
2010	1,168,901	19,399,878	309,321,666	675,249	11,005,746	172,901,776	$44,729	$51,371	$42,818
2011	1,169,156	19,499,241	311,556,874	679,305	11,294,065	176,091,617	44,812	51,982	43,619
2012	1,170,241	19,572,932	313,830,990	685,754	11,432,837	178,979,605	$45,291	$53,102	$44,529
2013	1,171,171	19,624,447	315,993,715	691,706	11,619,135	182,325,149	45,405	52,616	44,108
2014	1,171,007	19,651,049	318,301,008	698,178	11,865,515	186,233,715	$46,131	$53,576	$45,407
2015	1,170,550	19,654,666	320,635,163	706,870	12,099,184	190,325,822	48,287	55,603	47,104
2016	1,169,639	19,633,428	322,941,311	714,510	12,259,145	193,378,928	$48,588	$56,613	$47,358
2017	1,171,385	19,589,572	324,985,539	722,621	12,389,042	196,337,085	50,005	58,941	48,196
2018	1,170,564	19,530,351	326,687,501	727,664	12,651,358	200,284,186	$50,187	$59,411	$49,147
2019	1,167,594	19,453,561	328,239,523	725,112	12,873,580	203,809,516	51,572	60,351	49,971
2020	1,169,019	20,154,933	331,501,080	671,770	11,744,227	191,619,466	$54,966	$63,258	$52,380
2021E	1,171,134	19,835,913	331,893,745	743,879	13,206,953	209,319,103	$54,533	$63,229	$52,497
Projected	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States
2022	1,174,088	19,551,332	334,554,782	750,076	13,376,597	212,087,368	$55,415	$68,944	$54,137
2026	1,184,707	19,714,515	343,776,826	773,255	14,019,783	222,948,195	59,023	74,063	57,739
2031	1,195,835	19,882,977	355,171,046	799,703	14,787,733	236,437,342	$63,670	$80,665	$62,420
2036	1,203,989	20,002,311	366,230,596	823,064	15,505,776	249,724,570	68,450	87,470	67,290
2041	1,209,509	20,065,758	376,799,404	843,477	16,174,063	262,828,819	$73,376	$94,504	$72,374
	Compound Annual Growth Rate								
Historical	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States
2010 - 2015	0	0	0	0	0	0	$0	$0	$0
2015 - 2021	0.01%	0.2%	0.6%	0.9%	1.5%	1.6%	2.0%	2.2%	1.8%
2010 - 2021	0	0	0	0	0	0	$0	$0	$0
Projected	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States	Albany CSA	New York (a)	United States
2021 - 2026	0	0	0	0	0	0	$0	$0	$0
2026 - 2031	0.2%	0.2%	0.7%	0.7%	1.1%	1.2%	1.5%	1.7%	1.6%
2031 - 2036	0	0	0	0	0	0	$0	$0	$0
2036 - 2041	0.1%	0.1%	0.6%	0.5%	0.8%	1.0%	1.4%	1.6%	1.5%
2021 - 2041	0	0	0	0	0	0	$0	$0	$0

(a) State of New York

Sources: Historical: US Census Bureau, www.census.gov accessed June 2022. Projected: Woods & Poole Economics, Inc. 2021 MSA Profile

3.3.4 Unemployment Rates

Unemployment rates for the Albany MSA, New York State and the U.S. are provided below in **Table 3-2**. Unemployment rates for the CSA were not readily available so data for the MSA was substituted. Unemployment rates in the MSA have been lower than those for New York State and the U.S. every year from 2010 to 2021. In 2010, MSA unemployment was 7.4% compared to 8.7% for New York State and 9.6% for the U.S. By 2016, the MSA unemployment rate had fallen to 4.2% compared to 4.9% for both New York State and the U.S. In 2021, the MSA unemployment rate was 4.3% compared to 7.0% for New York State and 5.4% for the U.S

Table 3-2 – Historical Unemployment Rates

Historical	Albany MSA	New York State	United States
2010	7.4%	8.7%	9.6%
2011	7.2%	8.4%	8.9%
2012	7.4%	8.6%	8.1%
2013	6.5%	7.8%	7.4%
2014	5.1%	6.3%	6.2%
2015	4.5%	5.2%	5.3%
2016	4.2%	4.9%	4.9%
2017	4.3%	4.6%	4.4%
2018	3.8%	4.1%	3.9%
2019	3.5%	3.8%	3.7%
2020	6.9%	9.9%	8.1%
2021	4.3%	7.0%	5.4%

Source: US Bureau of Labor Statistics, www.bls.gov/data/data retrieval/top picks/unemployment, accessed June 2022

3.3.5 Employment by Industry Sector

Table 3-3 depicts the distribution of employment by industry sector for the Albany MSA, New York State and the U.S. The largest employment sector in the Albany MSA is Government which accounts for approximately 32.7% of total employment in 2021. As the New York State Capitol and seat of government for New York State, Albany's share of Government employment is considerably higher than the New York State average of 22.8% and the U.S. average of 19.4% in 2021. Other significant MSA employment sectors in 2021 include Trade, Transportation and Utilities at 19.5%, Professional and Business Services at 15.1%, and Leisure and Hospitality at 8.7% of total employment in 2021.

Table 3-3 – Employment by Industry Sector

Industry Sector	CSA 2010	CSA 2021	New York 2021	U.S. 2021
Mining, Logging and Construction	5.2%	5.3%	6.0%	7.0%
Manufacturing	6.4%	6.9%	6.5%	10.9%
Trade, Transportation and Utilities	22.8%	19.5%	22.6%	24.4%
Information Services	2.8%	2.0%	4.5%	2.5%
Professional and Business Services	16.0%	15.1%	20.3%	18.7%
Leisure and Hospitality	10.8%	8.7%	11.5%	12.4%
Other Services	5.2%	9.7%	5.8%	4.8%
Government	30.6%	32.7%	22.8%	19.4%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: www.bls.gov/data/data retrieval/top picks/employment, accessed April 26, 2022

Table 3-4 provides a list of the major employers in the CSA. The CSA includes a diverse group of employers led by New York State government which is its single largest employer with almost 52,000 employees. Other major employers include Albany Medical Center with 16,367 employees, St. Peter's Health Partners with 11,136 employees, Northeast Grocery 8,075 employees, the U.S. government with 7,900 employees, General Electric with 4,000 employees. Regeneron Pharmaceuticals, The University of Albany, Fluor Marine Propulsion Corporation, and the County of Albany are some of the other major employers within the CSA.

Table 3-4 – Major Employers in the CSA

Rank	Company	2021 Employees
1	New York State	51,800
2	Albany Medical Center	16,367
3	St. Peter's Health Partners	11,136
4	Northeast Grocery Inc.	8,075
5	U.S. Government	7,901
6	Hannaford Supermarkets	5,000
7	University of Albany	4,700
8	General Electric Company	4,000
9	Regeneron Pharmaceuticals	3,500
10	Stewart's Shops Corp.	3,099
11	Ellis Medicine	3,071
12	Global Foundries U.S. Inc.	3,000
13	Fluor Marine Propulsion Corp.	3,000
14	Glens Falls Hospital	2,736
15	County of Albany	2,497
16	Center for Disability Services	2,269
17	Community Care Physicians	1,794
18	St. Mary's Healthcare	1,692
19	Rensselaer Polytechnic Institute	1,673
20	Empire Blue Cross	1,643
21	CDPHP	1,100
22	KEYCORP	1,000
23	Momentive Performance Materials	1,000
24	SEFCU	945
25	Goldman Sachs Personal Financial	944

Source: Albany County Airport Authority Annual Budget for Year Beginning January 1, 2022 and Albany Business Review, July 9, 2021.

3.3.6 Gross Domestic Product

Table 3-5 presents the annual change in gross domestic product (GDP) for the Albany MSA, New York State, and the U.S. From 2010 - 2021, the GDP averaged annual growth of 1.2% for the MSA, 1.4% for New York State and 2.0% for the U.S. After significant declines for all three regions in 2020 of -3.5% in the MSA, -5.0% in New York and -3.4% for the U.S. Based on projections by the Congressional Budget Office and Woods & Poole, GDP is projected to grow by 1.4% per year in the Albany MSA, 1.8% in New York State and 1.9% for the U.S. over the 2021-2041 forecast period.

Table 3-5 – Gross Domestic Product

Percent Change in GDP			
Historical	**Albany MSA**	**New York State**	**United States**
2011	0.5%	0.2%	1.5%
2012	0.2%	3.8%	2.3%
2013	1.1%	0.1%	1.8%
2014	1.2%	1.8%	2.3%
2015	2.6%	1.5%	2.7%
2016	2.5%	2.2%	1.7%
2017	2.2%	1.2%	2.3%
2018	0.5%	2.7%	2.9%
2019	4.4%	2.5%	2.3%
2020	-3.5%	-5.0%	-3.4%
2021	n/a	5.0%	5.7%
GDP Compound Annual Growth Rates			
2010 - 2021(a)	1.2%	1.4%	2.0%
2021 - 2026	1.5%	2.0%	2.1%
2026 - 2031	1.4%	1.8%	2.0%
2031 - 2036	1.3%	1.7%	1.9%
2036 - 2041	1.2%	1.5%	1.8%
2021 - 2041	1.4%	1.8%	1.9%

(a) Represents the compound annual growth rate for the Albany MSA from 2010-2020.
Source: Historical data from US Bureau of Economic Analysis, www.bea.gov, accessed June 2022. Forecast Woods & Poole Economics, Inc. 2021 MSA Profile

3.3.7 Economic Basis for Forecast Aviation Demand

The forecast for aviation demand in this report is based primarily on the outlook for socio-economic growth in the air service area, New York State, and the U.S. Based on projections from Woods & Poole, population, employment, and personal income in the CSA are all projected to maintain steady growth similar to historical trends and will continue to provide a consistent economic base for aviation demand. Employment is projected to be anchored by the steady presence of the state and local government with resulting unemployment rates typically below that for the U.S. in total. Growth in local GDP for the MSA is projected to continue at a rate slightly above historical rates (1.4% forecast vs. 1.2% historical) as the region and the nation recover from recently depressed economic conditions. The outlook based on these socioeconomic factors is reflected in the aviation demand forecasts presented in the next section.

3.4 Historical Aviation Activity

3.4.1 Airlines Serving the Airport

The Airport is currently served by a diverse group of approximately 16 airlines. Included in the list are three mainline carriers, two low-cost carriers, two ultra-low-cost carriers and 9 regional carriers that provide feeder service to the three mainline carriers (American, Delta and United). Currently no international carriers provide scheduled air service at the Airport. **Table 3-6** depicts the airlines currently serving ALB.

Table 3-6 – Airlines Serving ALB as of September 2022

Mainline Carriers	Regional Carriers (Marketing Carrier Affiliation)	Low Cost Carriers	Ultra-Low Cost Carriers
American Airlines	Envoy (American)	JetBlue Airways	Allegiant Air
Delta Air Lines	PSA Airlines (American)	Southwest Airlines	Frontier Airlines (a)
United Airlines	Piedmont (American)		
	Republic (American & United)		
	Endeavor (Delta)		
	SkyWest (Delta)		
	Air Wisconsin (United)		
	CommuteAir (United)		
	GoJet (United)		

(a) Frontier Airlines plans to cancel ALB scheduled service in October 2022.
Source: Albany County Airport Authority records and Cirium Diio Mi Dynamic Schedule Report

3.4.2 Enplaned Passengers

The Airport serves primarily domestic origin and destination (O&D) passengers. According to the US Bureau of Transportation Statistics, from 2010 to 2021, domestic O&D passengers accounted for approximately 94.0% of total enplaned passengers at ALB and reached a high of approximately 98.0% in 2021. There have been no scheduled international enplanements since 2013.

Total enplanements at the Airport increased from 1.3 million to 1.5 million enplanements at an average rate of 2.0% from 2010 to 2019 prior to the start of the COVID-19 pandemic (see **Table 3-7**). Much like the trend experienced nationally, enplaned passengers declined by 65.8% in 2020 and rebounded by 87.7% in 2021 as the nation began to recover from the pandemic and its negative influence on travel and the economy. Over the full historical period of 2010 to 2021 total enplanements declined from 1.5 million in 2019 to 0.5 million in 2020 and 1.0 million in 2021. **Figure 3-2** shows a comparison of the historical annual percentage change in enplanements for ALB and the U.S.

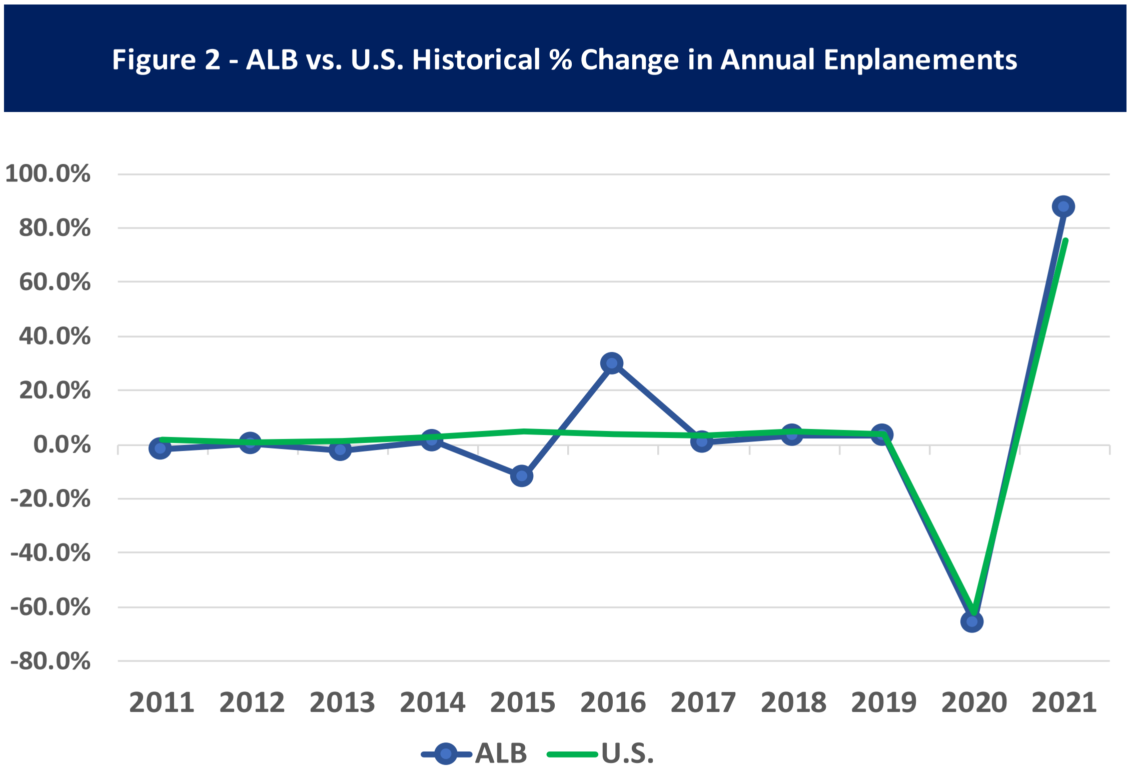
Most of the growth in total enplanements from 2010 to 2019 was driven by the air carrier airlines (airlines operating aircraft with greater than 60 seats), including the low-cost and ultra-low-cost airlines. From 2010 to 2019, air carrier enplanements increased by an average rate of 5.3% per year. Commuter carrier enplanements declined over the 2010 to 2019 period by -3.4% per year. Over the full historical period, air carrier enplanements increased from 0.7 million in 2010 to 1.1 million in 2019 before falling 68.7% to 0.3 million in 2020 and 0.6 million in 2021. Commuter carrier enplanements (airlines operating aircraft with 60 or fewer seats) declined from 0.6 million in 2010 to 0.4 million in 2019 before the declining by 58.2% to 0.2 million in 2020 and 0.3 million in 2021.

Table 3-7 – Historical Enplanements

Historical	Mainline	Regional	Total	% Change
2010	684,566	581,308	1,265,874	
2011	709,211	534,319	1,243,530	-1.8%
2012	721,089	524,791	1,245,880	0.2%
2013	696,608	519,379	1,215,987	-2.4%
2014	792,359	439,026	1,231,385	1.3%
2015	910,759	387,028	1,297,787	5.4%
2016	1,025,372	382,062	1,407,434	8.4%
2017	1,029,901	387,934	1,417,835	0.7%
2018	1,036,021	430,685	1,466,706	3.4%
2019	1,091,747	427,222	1,518,969	3.6%
2020	341,434	178,595	520,029	-65.8%
2021	649,443	326,594	976,037	87.7%
Compound Annual Growth Rates				
2010-2019	5.3%	-3.4%	2.0%	
2014-2019	6.6%	-0.5%	4.3%	
2010-2021	-0.5%	-5.1%	-2.3%	
2016-2021	-8.7%	-3.1%	-7.1%	

Source: Albany County Airport Authority Comprehensive Annual Financial Reports

Figure 3-2 – ALB vs. U.S. Historical % Change in Annual Enplanements



Source: Albany County Airport Authority and Cirium Diio Mi T-100 data, accessed June 2022.

3.4.3 Enplaned Passengers Airline Market Share

The Airport is served by a diverse group of airlines including three major legacy carriers American, Delta and United, the two largest low-cost airlines JetBlue and Southwest, and the two largest ultra-low-cost carriers Allegiant and Frontier. In 2021, Southwest had the largest enplaned passenger market share at the Airport at 32.8% of total enplanements followed by American with a 22.8% share, Delta with a 16.5% share, United at 11.8% and JetBlue at 7.7% market share. The two ultra-low-cost carriers Allegiant and Frontier both began service at the Airport in 2018 and have steadily grown over the last three years to represent enplaned passenger market shares of 5.1% and 3.2% respectively in 2021. Frontier recently announced that it will be discontinuing service at the Airport in October 2022. How Frontier's schedule changes will affect future market share distribution is unknown at the time of this report. The distribution of enplaned passenger market share has remained generally consistent through the first six months of 2022. **Table 3-8** depicts the enplaned passenger airline market share.

Table 3-8 – Enplaned Passenger Airline Market Share

Enplaned Passengers						
Airlines	**1H 2022 (a)**	**2021**	**2020**	**2019**	**2018**	**2017**
Southwest Airlines	161,026	319,869	174,133	488,147	565,731	566,801
American Airlines	128,082	222,576	134,035	312,378	296,558	302,591
Delta Air Lines	118,452	161,142	69,761	250,816	227,885	233,260
United Airlines	80,273	114,964	66,315	230,996	256,892	216,502
JetBlue Airways	44,447	75,211	29,793	92,149	89,609	90,744
Allegiant Air	29,541	50,033	28,588	78,107	3,635	0
Frontier Airlines	22,528	31,693	16,739	60,804	11,123	0
Charter/Other	32	549	665	5,572	15,273	7,937
Total Enplaned Passengers	**584,380**	**976,037**	**520,029**	**1,518,969**	**1,466,706**	**1,417,835**
Enplaned Passenger Market Share						
Airlines	**1Q 2022 (a)**	**2021**	**2020**	**2019**	**2018**	**2017**
Southwest Airlines	27.5%	32.8%	33.5%	32.1%	38.6%	40.0%
American Airlines	21.9%	22.8%	25.8%	20.6%	20.2%	21.3%
Delta Air Lines	20.3%	16.5%	13.4%	16.5%	15.5%	16.5%
United Airlines	13.8%	11.8%	12.8%	15.2%	17.5%	15.3%
JetBlue Airways	7.6%	7.7%	5.7%	6.1%	6.1%	6.4%
Allegiant Air	5.1%	5.1%	5.5%	5.1%	0.2%	0.0%
Frontier Airlines	3.9%	3.2%	3.2%	4.0%	0.8%	0.0%
Charter/Other	0.0%	0.1%	0.1%	0.4%	1.0%	0.6%
Total Market Share	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

(a) Source: 2021-2017 Albany County Airport Authority Comprehensive Annual Financial Reports, "1H" represents first six months of CY 2022 from Cirium's Diio Mi T-100 database, accessed September 2022

3.4.4 Air Cargo Tonnage

Table 3-9 provides historical air cargo activity. Air cargo tonnage has increased at an average rate of 1.1% per year from 2010-2019 followed by higher annual growth of 10.4% in 2020 and 13.1% in 2021. The COVID-19 pandemic had a positive impact on air cargo tonnage as shipments of medical and personal protective equipment increased along with an increase in shipping related to online shopping.

Historically, over 97% of air cargo tonnage at the Airport has been carried by the Freight/Express carriers such as FedEx and UPS (and their regional affiliates) with the remaining 3.0% carried as belly cargo on passenger aircraft. From 2010 to 2019 Freight/Express cargo tonnage increased at an average rate of 1.1% per year from 2010 to 2019 followed by an 11.0% increase in 2020 and a 13.3% increase in 2021. The remaining 3.0% of air cargo is carried by passenger airlines as belly cargo. Belly cargo decreased at an average rate of -4.6% per year from 2010 to 2019 followed by a 15.9% decline in 2020 as passenger airlines reduced flights because of the reduced demand for air service caused by the COVID-19 pandemic. Belly cargo declined by an additional 1.0% from 2020 to 2021.

Table 3-9 – Historical Air Cargo (Tons)

Historical	All-Cargo Operations	Freight/ Express (a)	% Change	Belly (b)	% Change	Total	% Change
2010	3,762	19,467		749		20,216	
2011	3,687	19,637	0.9%	740	-1.2%	20,377	0.8%
2012	3,722	19,709	0.4%	786	6.2%	20,494	0.6%
2013	3,634	19,999	1.5%	757	-3.7%	20,755	1.3%
2014	3,770	20,483	2.4%	675	-10.8%	21,158	1.9%
2015	3,774	20,275	-1.0%	761	12.7%	21,036	-0.6%
2016	4,264	21,377	5.4%	508	-33.2%	21,885	4.0%
2017	4,406	21,073	-1.4%	651	28.0%	21,724	-0.7%
2018	4,148	21,131	0.3%	567	-12.9%	21,697	-0.1%
2019	3,678	21,794	3.1%	491	-13.3%	22,285	2.7%
2020	2,796	24,188	11.0%	413	-15.9%	24,601	10.4%
2021	3,418	27,411	13.3%	409	-1.0%	27,821	13.1%
Compound Annual Growth Rates							
2010-2019	-0.1%	1.1%		-4.6%		1.1%	
2014-2019	-0.5%	1.2%		-6.1%		1.0%	
2010-2021	-0.8%	3.0%		-5.3%		2.9%	
2016-2021	-4.3%	5.1%		-4.2%		4.9%	

(a) Freight/Express tonnage includes air cargo carried on integrated carriers (FedEx and UPS), freight-only carriers and regional cargo feeder carriers.
(b) Belly tonnage is air cargo carried in the belly cargo hold of passenger airlines.
Source: U.S. DOT T-100 database, accessed June 2022

3.4.5 Aircraft Operations

Aircraft operations are defined as the total annual aircraft takeoffs and landings at the Airport and for this report are organized by air carrier, air taxi, general aviation, and military operations. The total number of air carrier, and air taxi, operations are defined as Commercial Operations. These categories of aircraft operations are used to facilitate a comparison of the master plan forecast to the FAA's Terminal Area Forecast (TAF). Provided below in **Table 3-10** and the following sections is a review of the Airport's historical aircraft operations.

3.4.6 Historical Air Carrier Operations

Air carrier operations are those operations on aircraft with a seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation. From 2010 to 2019 air carrier operations have remained generally steady with 24,791 in 2010 to 24,729 in 2019. Air carrier operations decreased by 38.1% to 15,303 in 2020 because of the COVID-19 pandemic and increased by 28.6% to 19,677 in 2021 as the passenger airlines have gradually begun adding back scheduled service.

3.4.7 Historical Air Taxi Operations

Air Taxi operations are operations by aircraft designed to have a maximum seating capacity of 60 seats or less or a maximum payload of 18,000 pounds or less carrying passengers of cargo for hire or compensation. From 2010 to 2019 air taxi operations have steadily declined from of 30,985 in 2010 to a low of 19,221 in 2019. This equates to a decline at an annual average rate of -5.2%. This was largely caused by an industry-wide shift to larger more fuel-efficient aircraft including commuter/feeder airlines switching to larger (greater than 60 seats) regional aircraft (although continuing to provide the same feeder service provided historically by smaller 45-60 seat aircraft). Like the fall-off in air carrier operations, Air Taxi operations decreased by 49.6% to 9,685 in 2020 because of the COVID-19 pandemic and increased by 11.8% to 10,831 in 2021 as the passenger airlines have gradually begun adding back scheduled service.

3.4.8 Historical Air Cargo Operations

Air cargo operations are those operations performed by cargo-only carriers such as FedEx and UPS, their regional affiliates and other freight-only scheduled and charter carriers. From 2010 to 2017 air cargo operations have remained generally steadily increasing from 3,762 operations in 2010 to a high of 4,406 in 2017. From 2019 to 2020, air cargo operations declined by 24.0% to 2,796 and increased 22.5% in 2021 to 3,418 (see **Table 3-9**). From 2010 to 2019, most of the increases and decreases in air cargo operations were by the commuter/air taxi aircraft that serve as regional affiliates of FedEx and UPS and/or provide independent air cargo service in the northeast region of the U.S. Air cargo service on mainline sized aircraft by FedEx and UPS have maintained a steady schedule of between 1,400 to 1,500 flights annually from 2010 to 2020. In 2021, FedEx added an additional flight to its service at the Airport.

3.4.9 Historical General Aviation Operations

General aviation (GA) operations are takeoffs and landings of all civil aircraft not classified as air carriers or commuter/air taxi and include aircraft such as small single-engine piston-powered aircraft, multi-engine turboprops, business jets, and helicopters. GA operations at ALB have declined from 28,521 in 2010 to 19,911 in 2018 and then increased in 2019 to 23,730 operations. Since 2019, GA operations have declined to 17,493 in 2021. The significant decline from 2019 to 2021 at ALB is largely the result of weaker economic conditions caused by the COVID-19 pandemic.

Military operations have remained generally steady over the 2010 to 2021 period and increase or decrease based solely on the US Department of Defense requirements. In 2010 military operations reached a peak of 8,129 operations but from 2011 to 2021 they have ranged between approximately 4,500 and 6,000 operations annually. In 2021, there were 4,227 Military operations at the Airport.

Table 3-10 – Historical Aircraft Operations

	Commercial Operations						
Historical	Air Carrier(a)	Air Taxi(b)	Total Commercial	General Aviation	Military	Total	%Change
2010	24,791	30,985	55,776	28,521	8,129	92,426	
2011	23,301	32,167	55,468	22,282	4,320	82,070	-11.2%
2012	22,902	27,259	50,161	21,100	4,557	75,818	-7.6%
2013	22,718	24,792	47,510	21,087	4,451	73,048	-3.7%
2014	21,746	22,645	44,391	23,730	4,547	72,668	-0.5%
2015	22,067	21,525	43,592	22,233	4,040	69,865	-3.9%
2016	23,108	24,256	47,364	20,912	5,207	73,483	5.2%
2017	23,274	23,810	47,084	19,985	5,285	72,354	-1.5%
2018	23,576	23,292	46,868	19,911	5,941	72,720	0.5%
2019	24,729	19,221	43,950	23,730	6,096	73,776	1.5%
2020	15,303	9,685	24,988	18,825	5,962	49,775	-32.5%
2021	19,677	10,831	30,508	17,493	4,227	52,228	4.9%
Compound Annual Growth Rates							
2010-2019	0.0%	-5.2%	-2.6%	-2.0%	-3.1%	-2.5%	
2014-2019	2.6%	-3.2%	-0.2%	0.0%	6.0%	0.3%	
2010-2021	-2.1%	-9.1%	-5.3%	-4.3%	-5.8%	-5.1%	
2016-2021	-3.2%	-14.9%	-8.4%	-3.5%	-4.1%	-6.6%	

Operations on aircraft with a seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation.
(b) Operations on aircraft with a seating capacity of 60 seats or less or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation.
Source: FAA OPSNET website, www.aspm.faa.gov/opsnet/sys/main.asp, report created September 22,2022.

3.4.10 Historical Based Aircraft

From 2010 to 2021 total based aircraft have ranged between a low of 72 in 2011 to a high of 102 in 2019. According to airport records and the Airport's FBO, approximately 20% of the based aircraft are jets, 7% are multi-engine and 62% are single-engine aircraft. **Table 3-12** provides the current breakdown of based aircraft by type. ALB is designated by the FAA as a Primary Airport (a commercial service airport with more than 10,000 passenger boardings each year), and therefore is not required to participate in the National Based Aircraft Inventory Program, therefore, the Airport Master Record (5010) is relied upon for based aircraft information.

Table 3-11 – Historical Based Aircraft

Year	Based Aircraft
2010	83
2011	72
2012	83
2013	95
2014	95
2015	82
2016	88
2017	97
2018	100
2019	102
2020	100
2021	97

Source: Airport records and FAA Airport Master Record (5010 Form)

Table 3-12 – 2021 Based Aircraft by Type

	Aircraft	Percent of Based Aircraft
Single Engine	60	62%
Multi-Engine	7	7%
Jet	19	20%
Helicopters	11	11%
Total	97	100%

Source: FAA Airport Master Record (5010 Form)

3.5 Aviation Demand Forecast

The aviation demand forecast provided below starts from a base year of 2021 (latest full calendar year for which data is available) and covers the forecast horizon periods of 2026, 2031, 2036 and 2041. The forecast is an unconstrained forecast which assumes that there are no facility, environmental, topographic, air traffic control, regulatory or other constraints limiting the growth of air traffic at the Airport. Included in the forecast are projections for enplaned passengers, aircraft operations, including passenger air carrier and commuter/air taxi operations; all-cargo operations; GA operations; and military operations. A projection of based GA aircraft is also provided. In addition, the forecast approach, methodology and primary assumptions driving the forecast are described below.

3.5.1 Enplaned Passenger Forecast

The preferred enplanement forecast was developed by regression analysis which compares the historical relationship between a dependent variable (enplanements) and an independent or predictor variable (GDP, income, population, etc.). For the ALB forecast, the dependent variable was total enplanements, and the predictor variable was identified as the total gross domestic product (GDP) for the Albany CSA projected by Woods & Poole. The predictor variable was selected through a process of running multiple regression analyses to test numerous socioeconomic variables such as population, employment, and income to determine the strongest correlation between total enplanements and the predictor variable.

The regression analysis testing the reliability of the correlation between total enplanements and CSA GDP produced an "R-squared" of 0.90. A perfect correlation between the dependent variable and the independent or predictor variable would result in an R-squared 1.0. In addition to the regression analysis, numerous other forecasting techniques, such as long-term trend analysis, market share analysis, propensity to travel, and comparison to other independent industry forecasts were evaluated to determine the reasonableness of the regression-based forecast. Based on this review the regression analysis comparing total enplanement to the CSA GDP was selected as the preferred forecasting method.

The regression equation comparing GDP sourced from Woods & Poole to historical enplanements was chosen as the preferred forecast based on its long-term growth rate which was comparable to ALB's historical growth rate from 2010 to 2019 of 2.0%, and its pace of growth which produced faster near-term growth which slowed over the forecast period. This forecast was also more conservative (lower long-term growth) than other forecasts reviewed which was preferred given the inherent uncertainty of the recovery from the pandemic-related decline in enplanements.

In addition to the preferred regression-based forecast, the enplaned passenger forecast was compared to several other standard forecasting methodologies. The first methodology was a travel propensity or trips per capita methodology. The average trips per capita (enplanements divided by population) from 2010 to 2019 was 1.06. When this travel propensity ratio was applied to forecast enplanements (sourced from Woods & Poole) enplanement growth averaged 0.2% per year from 2021 to 2041 and total enplanements never recovered to 2019 levels through 2041. This methodology was deemed too pessimistic and was rejected for forecast consideration.

The second methodology tested was trend analysis or applying historical growth rates to the baseline year of 2021. Because of the unusual decrease in enplanements from 2019 to 2020 and 2021, the historical growth rate of approximately 1.4% from 2010 to 2019 was used and applied to the estimated 2022 enplanements of 1.2 million. The 2022 enplanements were estimated based on year-to-date enplanements and an analysis of annual scheduled seats. Assuming the average annual growth rate of 1.4% would occur each year through 2041 resulted in a 2041 forecast of approximately 1.58 million enplanements or only slightly above the 2019 totals of 1.51 million enplanements. This methodology was rejected because the pace of recovery was judged to be too slow given the 2022 year-to-date activity and other industry forecasts for long-term enplanement growth.

A third methodology tested was a market share methodology tested based on ALB's historical share of national enplanements which was then extrapolated through 2041 using the FAA Aerospace Forecast of U.S. domestic enplanements as the baseline from which to project ALB's future enplanements. This methodology projected ALB's 2041 enplanements at approximately 2.3 million at an annual growth rate of 1.9% from 2019 to 2041. These results were considered reasonable and were compared to further forecast methodologies. The results of the market share analysis are provided below.

The fourth methodology tested was regression analysis. A series of simple (single) regression analyses were run comparing historical enplanements to several socioeconomic variables including population, employment, income, GDP, and domestic airline yield. The socioeconomic variables were sourced from U.S. Department of Commerce bureaus such as the Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, and Woods & Poole Economics, Inc. 2021 MSA Profile. The great majority of these regression analyses failed to produce a reliable statistical correlation with enplanements, meaning they produced an r-squared below 0.50 and were rejected as forecast methodologies. (Sample results of these regression analyses are included as an appendix to this report.) A regression analysis comparing the MSA GDP, sourced from Woods & Poole, for the period 2010 to 2019 versus historical enplanements produced statistically significant results with an r-squared of 0.90. This regression equation resulted in an enplanement forecast of approximately 2.1 million at an annual growth rate of 1.5% from 2019 to 2041. The key regression statistics are provided below.

Market Share Forecast Methodology

U.S. Market Share Forecast

FFY Years	ALB T-100 Enplanements	U.S. Domestic Enplanements	ALB Forecast Enplanements	ALB U.S. Market Share
2010	1,244,766	634,804,193	1,244,766	0.196%
2011	1,210,963	650,069,596	1,210,963	0.186%
2012	1,219,458	653,750,263	1,219,458	0.187%
2013	1,194,520	654,351,820	1,194,520	0.183%
2014	1,188,349	668,904,219	1,188,349	0.178%
2015	1,239,137	696,200,475	1,239,137	0.178%
2016	1,360,495	726,085,751	1,360,495	0.187%
2017	1,374,002	743,717,643	1,374,002	0.185%
2018	1,407,480	780,654,359	1,407,480	0.180%
2019	1,471,664	812,785,469	1,471,664	0.181%
2020	783,803	462,081,528	783,803	0.170%
2021	733,405	507,111,881	733,405	0.145%
2022		645,486,927	**1,186,923**	0.186%
2023		814,874,954	**1,498,395**	0.181%
2024		858,208,208	**1,578,076**	0.181%
2025		873,237,665	**1,605,712**	0.181%
2026		891,492,502	**1,639,279**	0.181%
2027		913,853,592	**1,680,397**	0.181%
2028		934,373,469	**1,718,129**	0.181%
2029		957,009,533	**1,759,752**	0.181%
2030		980,073,384	**1,802,162**	0.181%
2031		1,001,526,768	**1,841,610**	0.181%
2032		1,021,938,963	**1,879,144**	0.181%
2033		1,045,797,629	**1,923,016**	0.181%
2034		1,072,643,309	**1,972,380**	0.181%
2035		1,101,887,903	**2,026,155**	0.181%
2036		1,128,586,234	**2,075,248**	0.181%
2037		1,156,690,323	**2,126,926**	0.181%
2038		1,187,653,860	**2,183,862**	0.181%
2039		1,218,537,442	**2,240,650**	0.181%
2040		1,248,841,672	**2,296,374**	0.181%
2041		1,283,063,502	**2,359,301**	0.181%
ALB Average U.S. Market Share 2010-2019			0.184%	
CAGR 2019-2041		2.1%	2.2%	

Source: U.S. enplanements from 2022-2042 FAA Aerospace Forecast, Table 5, U.S. Commercial Air Carriers, Domestic Revenue Passenger Enplanements. ALB enplanements from Cirium's Diio Mi T-100 database, accessed July 2022.

Preferred Forecast Regression Analysis

Calendar Year	Dependent Variable: Enplanements	Independent Variable: CSA GDP WP 2012$ (000s)
2010	1,265,874	$60,099
2011	1,243,530	59,406
2012	1,244,976	59,946
2013	1,215,076	61,250
2014	1,231,385	62,510
2015	1,298,210	65,187
2016	1,407,434	67,134
2017	1,417,835	68,494
2018	1,466,706	69,634
2019	1,518,969	$72,010

Source: Enplanements from ACAA records and GDP from Woods & Poole Economics, 2021 MSA Profile.

Regression Statistics	
Multiple R	0.952511974
R Square	0.90727906
Adjusted R Square	0.895688943
Standard Error	35845.25596
Observations	10

	Coefficients
Intercept	-167790.9013
CSA GDP	23.21301116

	t Stat	*P-value*
Intercept	-0.988288915	0.351955813
CSA GDP	8.847621289	0.00002101

The second-best regression analysis (based on r-squared) was New York State GDP, sourced from the Bureau of Economic Analysis, for the period 2010 to 2019 versus enplanements produced an r-squared of 0.88. The results of the regression equation produced a 2041 forecast of approximately 2.9 million at an annual growth rate of 3.0%.

Enplaned passengers are forecast to increase from approximately 1.0 million in 2021 (976,037) to 1.2 million in 2022 and to 2.1 million in 2041 which equates to an annual growth rate of 3.9% per year from 2021 to 2041 (see **Table 3-13**). The forecast projects enplanements to increase by approximately 23.2% from 2021 to 2022 which is below the ALB TAF projection of a 36.1% increase from fiscal year 2021 to fiscal year 2022.

Total scheduled seats for 2022 are estimated at 1.6 million and a 35.0% increase over 2021 (see **Table 3-14**). In August 2022, Frontier Airlines announced it will discontinue service at ALB in October 2022. Frontier began service at ALB in September 2018 and since then it has accounted for between approximately 3.2% and 4.0% of ALB enplanement market share. In May 2022, before Frontier's announcement to discontinue service, 2022 scheduled seats at ALB were projected at 1,621,818. The removal of Frontier's scheduled service has resulted in only a marginal change (-0.21%) in 2022 ALB scheduled seats to 1,618,480 based on published airline schedules for September 2022 that include Frontier's service cancellation. *(The above-referenced scheduled seat data was accessed from Cirium's Diio Mi Schedule database on May 23, 2022, and September 22, 2022, respectively)*. When scheduled seats for 2022 are compared to forecast enplanements the forecast would result in a load factor of 74.0% which is considerably lower than the load factor recorded from 2010 to 2019 (before the COVID-19 pandemic) of approximately 80%. Based on the latest available U.S. DOT T-100 data (accessed from Cirium's Diio Mi T-100 database on September 23, 2022) the scheduled passenger load factor at ALB for the six-month period, January-June 2022 was 82.5% with 584,830 enplanements. These traffic statistics for the first half of 2022 suggest that actual results are tracking close to the forecast projections and the first half data does not include July and August results which are typically the busiest months of the year at ALB.

Table 3-13 – Enplaned Passenger Forecast

Enplaned Passengers	Actual		Forecast				
	2010	2021	2022	2026	2031	2036	2041
Mainline	684,566	649,443	1,080,000	1,444,000	1,560,000	1,674,000	1,786,000
Regional	579,815	326,594	122,000	260,000	281,000	301,000	321,000
Total Enplaned Passengers	1,264,381	976,037	1,202,000	1,704,000	1,841,000	1,975,000	2,107,000
Enplaned Passengers	**Actual**		**Compound Annual Growth Rates**				
	2010-2021		**2021-2026**	**2026-2031**	**2031-2036**	**2036-2041**	**2021-2041**
Mainline	-0.5%		17.3%	1.6%	1.4%	1.3%	5.2%
Regional	-5.1%		-4.5%	1.6%	1.4%	1.3%	-0.1%
Total Enplaned Passengers	-2.3%		11.8%	1.6%	1.4%	1.3%	3.9%

Source: Historical enplaned passengers from ACAA records. Forecast by Jacobsen Daniels Associates.

Table 3-14 – Scheduled Seats and Estimated Load Factors

Schedule Data	2022 Estimated	2021	2020	2019	2018
Departing Flights	14,913	11,728	10,532	18,369	20,075
Scheduled Seats	1,618,480	1,200,643	1,089,854	1,833,929	1,756,292
Enplanements	1,202,000	975,488	519,364	1,516,672	1,465,445
Estimated Load Factor	74.3%	81.2%	47.7%	82.7%	83.4%

Source: Enplanements provided by Albany County Airport Authority Annual Financial Reports. 2022 estimated enplanements provided by Jacobsen Daniels Associates. Departing flights and scheduled seats provided by Cirium's Diio Mi. Schedule data accessed September 22, 2022.

3.5.2 Air Carrier and Commuter/Air Taxi Operations Forecast

Presented in **Table 3-16** below is the aircraft operations forecast for Air Carrier aircraft (aircraft with greater than 60 seats) and Commuter/Air Taxi aircraft (aircraft with 60 or fewer seats). These forecasts include the projected operations for both passenger and all-cargo operations.

The aircraft operations forecasts for passenger Air Carriers and Commuter/Air Taxis are based on scheduled airline seats for 2022, projected seats per departure, estimated airline load factors, and enplanements per departure. Based on the airline schedule for 2022 and year-to-date enplanements through the first half of 2022, passenger Air Carrier average seats per departure are projected at approximately 109 seats/departure. The airline load factor, based on airline schedule data for 2022 and year-to-date through June airport statistics, is estimated at 74.0% which equates to a projected 81 enplanements per departure. Projected enplanements for 2022 of 1.2 million are divided by the estimated enplanements per departure of 81 resulting in projected passenger departures of approximately 14,900 departures or approximately 29,800 operations. Total passenger operations were then allocated to air carrier and commuter/air taxi operations based on their historical share of operations. Based on year-to-date activity and schedule data, passenger air carrier operations are estimated to represent approximately 72% of total passenger operations in 2022. This ratio is forecast to increase gradually over the forecast horizon to 85% in 2041 as larger regional jets (more than 60 seats) enter the airline fleet. This methodology is repeated each year through 2041 to develop the passenger aircraft operations forecast.

3.5.3 All-Cargo Operations Forecast

Presented in **Table 3-15** below is the all-cargo aircraft operations forecast (operations by airlines that transport cargo only). All-cargo tonnage is projected to increase on an annual basis at the freight/express tonnage growth rate that occurred from 2010 to 2019 of approximately 1.1% per year. The 2010-2019 growth rate was used to avoid the influence of the surge in air cargo demand that occurred in 2020 and 2021 and is a more reasonable indicator of future demand.

All-cargo operations are performed by both air carrier and commuter/air taxi sized aircraft. The size of the all-cargo aircraft is projected to increase as evidenced by the recent addition of the FedEx Airbus A300 aircraft to its regular Sunday service at the Airport and plans by both FedEx and UPS to increase use of larger Boeing 767 aircraft. In the future, the A300 and 757 will likely be replaced with younger widebody cargo planes such as the Boeing 767.

The historical distribution of all-cargo operations has been split approximately equally between air carrier and commuter/air taxi operations. This distribution of operations is projected to continue over the forecast period resulting in growth of all-cargo operations of 0.8% per year from 2021 to 2041 with total all-cargo operations forecast to increase from 3,418 in 2021 to 4,020 in 2041.

Table 3-15 – All-Cargo Operations Forecast

All-Cargo Operations (a)	Actual	Forecast				
	2021	2022	2026	2031	2036	2041
Air Carrier (a)	1,716	1,730	1,790	1,860	1,940	2,020
Commuter/Air Taxi (b)	1,702	1,720	1,770	1,850	1,920	2,000
Total Commercial Operations	3,418	3,450	3,560	3,710	3,860	4,020
All-Cargo Operations	**Forecast**	**Compound Annual Growth Rates**				
	2021-2022	**2021-2026**	**2026-2031**	**2031-2036**	**2036-2041**	**2021-2041**
Air Carrier (a)	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Commuter/Air Taxi (b)	1.1%	0.8%	0.9%	0.7%	0.8%	0.8%
Total Commercial Operations	0.9%	0.8%	0.8%	0.8%	0.8%	0.8%

(a) Air carrier operations based on passenger aircraft designed to carry more than 60 seats. Includes all-cargo operations only.
(b) Commuter/Air Taxi operations based on passenger aircraft designed to carry 60 or fewer seats. Includes all-cargo operations only.
Source: Historical aircraft operations from ACAA records. Forecast by Jacobsen Daniels Associates.

Total Air Carrier operations, which include passenger and all-cargo flights, are projected to increase from 19,677 in 2021 to 42,600 in 2041 at an average growth rate of 3.9% per year. From 2021 to 2022 Air Carrier operations are projected to increase by 17.9% as the airline industry adds back service following the reduction in COVID-19 travel restrictions and an overall increase in air service demand. For comparison, from 2019 to 2020 Air Carrier operations decreased by over 30% at the start of the COVID-19 pandemic. After the initial rebound in Air Carrier operations in 2022, the long-term growth from 2022 to 2041 is projected at an average annual growth of 3.9% per year.

Commuter/Air Taxi operations are projected to decrease at an average rate of -0.8% per year from 2021 to 2041. In 2022, the share of Commuter/Air Taxi scheduled departures declined from a pre-pandemic average of approximately 44.0% of total operations to approximately 28.0% of total operations. Commuter/Air Taxi operations are projected to gradually decrease their share of operations to approximately 15% in 2041 as the airlines continue to replace smaller regional jets with aircraft designed for more than 60 seats (air carrier aircraft).

Table 3-16 – Aircraft Operations Forecast

Commercial Operations	Actual	Forecast				
	2021	2022	2026	2031	2036	2041
Air Carrier (a)	19,677	23,200	33,600	36,500	40,500	42,600
Commuter/Air Taxi (b)	10,831	10,100	11,800	10,000	8,700	9,200
Total Commercial Operations	30,508	33,300	45,400	46,500	49,200	51,800
Commercial Operations	**Forecast**	**Compound Annual Growth Rates**				
	2021-2022	**2021-2026**	**2026-2031**	**2031-2036**	**2036-2041**	**2021-2041**
Air Carrier (a)	17.9%	3.3%	1.7%	2.1%	1.0%	3.9%
Commuter/Air Taxi (b)	-6.7%	-1.4%	-3.3%	-2.7%	1.1%	-0.8%
Total Commercial Operations	9.2%	9.2%	0.5%	1.1%	1.0%	2.7%

(a) Air carrier operations based on passenger aircraft designed to carry more than 60 seats. Includes passenger operations only.
(b) Commuter/Air Taxi operations based on passenger aircraft designed to carry 60 or fewer seats. Includes passenger operations only.
Source: Historical aircraft operations FAA OPSNET website www.aspm.ff.gov/opsnet/sys/main.asp, report created September 22, 2022. Forecast by Jacobsen Daniels Associates.

3.5.4 General Aviation and Military Operations

The forecast of general aviation operations is provided in **Table 3-17**. General aviation operations are classified as itinerant and local and both categories are expected to increase over the forecast period. Historically, GA operations at ALB tend to follow the directional changes in national GA activity (generally increasing or decreasing). The forecast for general aviation is primarily based on the long-term forecast for the U.S. as described in the 2021 FAA Aerospace Forecast which projects annual itinerant growth of 1.1% from 2021 to 2041 and local operations growth of approximately 0.7% annually over the same period. Total general aviation operations at ALB are projected to increase at an annual rate of 1.0% from 2021 to 2041.

Multiple methodologies were used to develop the GA operations forecast and the FAA Aerospace annual GA growth rate applied to ALB was determined as the preferred forecast for master plan purposes. For example, a trend analysis based on pre-pandemic historical growth from 2010 to 2019 produced a forecast equating to (-2.0%) annual growth over the forecast period. This was rejected as too pessimistic. Using a national market share methodology resulted in annual growth of 0.7% over the forecast period. The Airport's share of national GA (based on FAA Aerospace National GA Operations) operations declined significantly from 2010 to 2015 but has leveled off since then at an average of 0.067% from 2015 to 2021. Assuming this ratio remains constant over the forecast period results in annual GA operations growth of 0.71% from 2021 to 2041, and using operations per-based aircraft methodology resulted in an annual growth rate of 1.1% over the forecast period.

The FAA Aerospace forecast provided a middle ground growth rate of 1.0% over the forecast period and this was selected as the preferred forecast for master planning purposes. The increase in ALB GA operations is forecast to occur based on the projected shift in the ALB fleet mix from single-engine aircraft to jet and helicopter aircraft (see **Table 3-18**). Given that jet aircraft are primarily used in itinerant operations the increase in the jet fleet is projected to drive an increase in itinerant GA operations which is forecast to drive an overall increase in ALB GA operations from approximately 17,500 in 2021 to 21,500 in 2041.

Military operations are determined solely by the Department of Defense and therefore they have been held constant with no growth projected over the 2021 to 2041 forecast period.

Table 3-17 – General Aviation and Military Operations Forecast

	Actual	Forecast				
General Aviation Operations	**2021**	**2022**	**2026**	**2031**	**2036**	**2041**
Itinerant	14,534	15,000	15,900	17,200	17,900	18,700
Local	2,959	2,450	2,500	2,600	2,700	2,800
Total General Aviation	**17,493**	**17,450**	**18,400**	**19,800**	**20,600**	**21,500**
Military						
Itinerant	3,581	3,580	3,580	3,580	3,580	3,580
Local	646	650	650	650	650	650
Total Military	**4,227**	**4,230**	**4,230**	**4,230**	**4,230**	**4,230**
General Aviation/Military Operations						
Total General Aviation/Military Operations	**21,720**	**21,680**	**22,630**	**24,030**	**24,830**	**25,730**
	Forecast	**Compound Annual Growth Rates**				
General Aviation	**2021-2022**	**2021-2026**	**2026-2031**	**2031-2036**	**2036-2041**	**2021-2041**
Itinerant	3.2%	1.8%	1.6%	0.8%	0.9%	1.3%
Local	-17.2%	-3.3%	0.8%	0.8%	0.7%	-0.3%
Total General Aviation	**-0.2%**	**1.0%**	**1.5%**	**0.8%**	**0.9%**	**1.0%**
Military						
Itinerant	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Local	0.6%	0.6%	0.1%	0.0%	0.0%	0.0%
Total Military	**0.1%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Source: Historical aircraft operations FAA OPSNET website www.aspm.ff.gov/opsnet/sys/main.asp, report created September 22, 2022. Forecast by Jacobsen Daniels Associates.

3.5.5 Based Aircraft

ALB currently has a fleet of 97 based aircraft. Over the 2021 to 2041 forecast period it's projected that the total number of based aircraft will increase to 104 and the composition of the fleet will change as presented in **Table 3-18** below. The increase in the based aircraft and changes to the fleet mix are based on discussions with the Airport regarding local interest, their ability to provide facilities to accommodate growth and the FAA Aerospace Forecast for Fiscal Years 2021-2041, "Active General Aviation and Air Taxi Aircraft" forecast growth rates. The number of based aircraft at ALB has steadily increased from 83 in 2010 to a high of 102 in 2019 and is currently at

97. The Airport has no current plans for significant investment in additional GA facilities and several general aviation airports within the ALB air trade area can provide facilities should there be regional demand for additional based aircraft positions. The Airport expects future demand for smaller single-engine and multi-engine aircraft positions will shift to regional GA airports while demand for jet and helicopter positions will be accommodated at ALB. Given that ALB does not have significant demand for any specific category of GA aircraft, the forecast growth rates in based aircraft are projected to generally follow national trends. The primary changes in the long-term based aircraft fleet mix include the decrease in single-engine piston aircraft and an increase in jets and helicopters.

Table 3-18 – Based Aircraft Forecast

Based Aircraft	2021	2026	2031	2036	2041
Single Engine	60	57	55	53	48
Multi-Engine	7	7	7	7	6
Jet	19	22	24	27	34
Helicopters	11	12	12	13	15
Total	97	98	98	100	103

Source: Annual growth rates sourced from FAA Aerospace Forecast Fiscal Years 2021-2041, Table 28 Active General Aviation and Air Taxi Aircraft. Forecast prepared by Jacobsen Daniels Associates

3.5.6 Comparison to FAA Terminal Area Forecast

Presented below in **Table 3-19** is a comparison of the 2021 TAF for Albany International Airport and the 2022 Albany Master Plan Forecast. The forecasts are compared based on passenger enplanements, commercial operations, and total operations using the FAA's required template for forecast comparisons. The Albany Master Plan Forecast differs from the TAF's passenger enplanement forecast by 24.3% for the base year of 2021, 6.5% at the base year plus 5 years (2026), 4.4% at the base year plus 10 years (2031), and 2.8% for the base year plus 15 years (2036). The significant difference between the 2021 TAF and the 2021 master plan enplanement forecast is primarily the result of a timing difference. The master plan results for 2021 are based on actual enplanement counts for the calendar year 2021 (provided by Airport management records), whereas the 2021 TAF enplanements are based on partial year estimates for the federal fiscal year 2021 ending September 30, 2021.

The forecast of commercial operations for the Master Plan Forecast differs from the TAF by (-11.4%) in the base year, 4.6% in the base year plus 5 years, 0.1% for the base year plus 10 years, and (-3.5%) for the base year plus 15-years. The large difference in 2021 for enplanements and operations can be largely explained by the fact that the TAF base year 2021 is a forecast for federal fiscal year 2021 versus 2021 Airport activity which is based on actual calendar year data for the Airport.

These results indicate that the Albany Master Plan Forecast are consistent with the TAF and varies by less than 10% in the 5-year forecast period and less than 15% in the 10-year forecast period.

Table 3-20 provides a more detailed breakout of passenger enplanements, aircraft operations, cargo tonnage, and based aircraft presented using the FAA template for TAF comparison.

Table 3-19 – FAA TAF Forecast Comparison

Passenger Enplanements	Forecast Years	ALB Master Plan Forecast	FAA 2021 TAF	Percent Variance from 2021 TAF
Base year	2021	976,037	785,418	24.3%
Base year + 5 years	2026	1,704,000	1,599,317	6.5%
Base year + 10 years	2031	1,841,000	1,762,820	4.4%
Base year + 15 years	2036	1,975,000	1,921,801	2.8%
Commercial Operations				
Base year	2021	30,508	27,396	11.4%
Base year + 5 years	2026	45,394	43,415	4.6%
Base year + 10 years	2031	46,432	46,465	-0.1%
Base year + 15 years	2036	49,170	50,980	-3.5%
Total Operations				
Base year	2021	52,228	49,520	5.5%
Base year + 5 years	2026	68,024	71,389	-4.7%
Base year + 10 years	2031	70,462	74,574	-5.5%
Base year + 15 years	2036	74,000	79,225	-6.6%

Source: 2021 enplanements from ACAA records. 2021 operations from FAA OPSNET website www.aspm.faa.gov/opsnet/sys/main.asp, report created September 22, 2022. Forecast provided by Jacobsen Daniels Associates.

Table 3-20 – FAA TAF Forecast Summary Template

Passenger Enplanements	Base Year 2021	Forecast				Compound Annual Growth Rates			
		Base Year (+1 Year) 2022	Base Year (+5 Years) 2026	Base Year (+10 Years) 2031	Base Year (+15 Years) 2036	Base Year (+1 Year) 2021-2022	Base Year (+5 Years) 2021-2026	Base Year (+10 Years) 2021-2031	Base Year (+15 Years) 2021-2036
Air Carrier	649,443	1,080,000	1,444,000	1,560,000	1,674,000	66.3%	17.3%	9.2%	6.5%
Commuter	326,594	122,000	260,000	281,000	301,000	-62.6%	-4.5%	-1.5%	-0.5%
Total	**976,037**	**1,202,000**	**1,704,000**	**1,841,000**	**1,975,000**	**23.2%**	**11.8%**	**6.6%**	**4.8%**
Aircraft Operations									
Itinerant									
Air Carrier	19,677	23,220	33,581	36,468	40,451	18.0%	11.3%	6.4%	4.9%
Commuter/Air Taxi	10,831	10,052	11,813	9,964	8,719	-7.2%	1.8%	-0.8%	-1.4%
Total Commercial Operations	**30,508**	**33,272**	**45,394**	**46,432**	**49,170**	**9.1%**	**8.3%**	**4.3%**	**3.2%**
Itinerant									
General Aviation	14,534	15,000	15,900	17,200	17,900	3.2%	1.8%	1.7%	1.4%
Military	3,581	3,580	3,580	3,580	3,580	0.0%	0.0%	0.0%	0.0%
Local									
General Aviation	2,959	2,450	2,500	2,600	2,700	-17.2%	-3.3%	-1.3%	-0.6%
Military	646	650	650	650	650	0.6%	0.1%	0.1%	0.0%
Total Operations	**52,228**	**54,952**	**68,024**	**70,462**	**74,000**	**5.2%**	**5.4%**	**3.0%**	**2.4%**
Cargo Tons									
Total	22,800	23,267	25,233	27,925	30,904	2.0%	2.0%	2.0%	2.0%
Based Aircraft									
Single-engine	60	59	57	55	53	-1.7%	-1.0%	-1.0%	-0.9%
Multi-engine	7	7	7	7	7	-0.5%	-0.5%	-0.5%	-0.5%
Jet	19	20	22	24	27	5.3%	2.5%	2.5%	2.4%
Helicopter	11	11	12	12	13	1.3%	1.3%	1.3%	1.3%
Total	**97**	**97**	**98**	**98**	**100**	**0.1%**	**0.0%**	**0.1%**	**0.1%**

Source: 2021 enplanements from ACAA records. 2021 operations from FAA OPSNET website www.aspm.faa.gov/opsnet/sys/main.asp, report created September 22, 2022. Forecast provided by Jacobsen Daniels Associates.

3.5.7 Commercial Aircraft Fleet Mix Distribution

This section and **Table 3-21** provide the fleet mix distribution by percentage of total passenger aircraft operations by aircraft type based on the forecast of total commercial operations for the peak month average day in 2022, and forecast years 2022, 2026, 2031, 2036, and 2041. The peak month was identified as July 2022 and determined by analyzing the monthly scheduled seats for 2022. Over the previous five years, 2017-2021 the peak month was different each year and therefore airline schedule data for 2022 was used to select a projected peak month for the forecast period.

The forecast fleet mix distribution was based on the current aircraft fleet mix (July 2022), individual airline aircraft orders (firm orders and options), recent trends in airline scheduling practices, the likely replacement of aging aircraft (50-seat regional jets phased out for 70-seat and larger aircraft), and projected airline trends from other independent forecasts such as the FAA Aerospace Forecast, the Boeing Commercial Market Outlook, and the Airbus Global Market Forecast.

Table 3-21 – Passenger Aircraft Fleet Mix Departures by Equipment Type

Domestic Airlines	Peak Month Average Day Departures						Percent by Aircraft					
	2021	2022	2026	2031	2036	2041	2021	2022	2026	2031	2036	2041
Narrowbody												
A220	0	0	3	3	4	6	0.0%	0.0%	4.8%	4.6%	5.7%	8.3%
A319	1	2	2	3	1	1	2.9%	4.2%	3.2%	4.6%	1.4%	1.4%
A320	5	9	8	7	5	5	13.8%	19.7%	12.9%	10.6%	7.1%	6.9%
A320 neo	0	1	3	3	4	5	0.5%	2.5%	4.8%	4.6%	5.7%	6.9%
A321	0	0	0	0	1	1	0.3%	0.3%	0.3%	0.3%	1.4%	1.4%
B717-200	1	0	0	0	0	0	2.7%	0.2%	0.2%	0.2%	0.2%	0.2%
B737-700	4	3	4	4	4	4	10.7%	5.7%	5.7%	5.7%	5.7%	5.8%
B737-800	4	5	5	7	7	7	9.8%	10.1%	8.0%	10.1%	10.0%	10.2%
B737-900	0	0	0	0	1	1	0.1%	0.4%	0.4%	0.4%	1.4%	1.4%
B737 Max 8	1	0	0	1	2	1	1.7%	0.6%	0.6%	1.5%	2.9%	1.4%
B737 Max 9	0	0	0	2	2	0	0.0%	0.0%	0.0%	3.0%	2.9%	0.0%
Subtotal Narrowbody Aircraft	**17**	**20**	**26**	**30**	**31**	**32**	**42.5%**	**43.8%**	**41.1%**	**45.6%**	**44.5%**	**43.8%**
Region Jets - More than 60 seats												
CRJ-700	4	4	7	5	4	3	9.6%	9.3%	11.2%	7.6%	5.7%	4.1%
CRJ-900	4	7	9	8	8	11	9.7%	15.5%	14.5%	12.2%	11.4%	15.7%
ERJ-170	0	1	4	7	10	14	0.8%	2.9%	6.4%	10.6%	14.3%	19.3%
ERJ-175	3	3	7	10	12	12	8.1%	6.9%	11.2%	15.2%	17.1%	16.5%
ERJ-190	1	0	0	2	3	0	1.4%	0.3%	0.0%	3.0%	4.3%	0.3%
Subtotal RJs - More than 60 seats	**12**	**16**	**27**	**32**	**37**	**41**	**29.6%**	**35.0%**	**43.4%**	**48.6%**	**52.8%**	**55.9%**
Regional Jets - 60 seats or fewer												
CRJ 100/200	0	0	0	0	0	0	1.1%	0.3%	0.3%	0.3%	0.3%	0.3%
CRJ-550	1	1	1	2	2	0	3.7%	2.4%	2.4%	2.4%	2.4%	0.0%
ERJ-135/140/145	9	9	8	2	0	0	23.0%	18.5%	12.9%	3.0%	0.0%	0.0%
Subtotal RJs - 60 seats or fewer	11	10	10	4	2	0	27.9%	21.2%	15.6%	5.7%	2.7%	0.3%
PMAD Passenger Aircraft Departures												
Total	**40**	**46**	**62**	**66**	**70**	**73**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Forecasts provided by Jacobsen Daniels Associates

3.5.8 Critical Aircraft Forecast

The critical aircraft forecast uses historical information to project the largest or most demanding aircraft anticipated to conduct a minimum of 500 annual operations at the Airport. This designation is used to size runways and taxiways in the master plan.

Based on a review of the FAA's Traffic Flow Management System Counts (TFMSC) for 2021, the Boeing 737-800 and 757-200 represent the most demanding aircraft that conduct a minimum of 500 annual operations. The B737-8 has a Runway Design Code (RDC) of D-III while the B757-200 has an RDC of C-IV. To accommodate both the D-III and C-IV aircraft the existing critical aircraft has a combined RDC of D-IV (note: the FAA design standards for C-IV and D-IV are identical).

Table 3-22 provides a summary of the operations by each aircraft for CY2021. The following describes the assumptions related to the forecast for critical aircraft for both passenger and cargo airlines and the recommended future critical aircraft.

Table 3-22 – Historical Critical Aircraft Operations

Aircraft	Aircraft Approach Category (AAC)	Aircraft Design Group (ADG)	Taxiway Design Group (TDG)	2021
737-800	D	III	4	2,376
757-200	C	IV	4	1,737

Source: TFMSC 2021, FAA AC 150/5300-13B

Passenger Airlines: ALB has had daily scheduled service by all four major US airlines (i.e., American, Delta, United, and Southwest) for over 20 years, with no disruptions in service during that time frame. These airlines are responsible for over 90% of the total enplanements and scheduled departures. Low cost' airlines, Jet Blue and Allegiant also serve ALB, with varying service by a few other airlines comprising the remaining airline service.

All of these existing airlines provide service by narrow-body aircraft with over 100 passenger seats, including the Boeing 737 series and Airbus A320 series. These aircraft all have an ARC of C/D-III, and a Taxiway Design Group (TDG) of 3. In 2021, even with reduced activity due to COVID-19, these aircraft types conducted 9,389 annual operations at ALB according to the FAA TFMSC. As such, for the terminal area these narrow-body airliners currently represent the critical aircraft.

In considering the future use of these aircraft types, all of these airlines have business plans that include continued or expanded service using this class of aircraft. Below are the Major Airline's current count and publicly released plans for their B737 and A320 aircraft.

Table 3-23 – Boeing 737 or Airbus A320 Series

Major Airlines Serving ALB	Current	Parked*	On Order
American	793	55	1
Delta	477	50	8
Southwest	732	47	27

*Due to maintenance, COVID-19, or other reasons
Source: www.planespotters.net

Three of the existing airlines, Delta, American, and United, also operated larger widebody aircraft for passenger service. However, there are no plans to introduce these larger aircraft at ALB (i.e., A330, B777, B787, etc.). The Airport is also in discussions with additional airlines, and additional routes by existing airlines; however, any new service is also anticipated to use B737, A320, or regional jets. As such, it is concluded that the existing narrow-body aircraft service ALB will remain the Critical Aircraft for the passenger terminal area throughout the 20-year planning period.

Passenger Aircraft Notes: Airline service and aircraft types at ALB:

- Boeing 757 has not previously or currently provided scheduled airline service. No airlines plan to introduce passenger service with this aircraft.
- Several smaller narrow-body aircraft types have been phased out of service, recently including the Boeing 717, MD-80 series.
- All turbo-prop airline aircraft have been phased-out of service, including use of the ATR-42, Saab 340, DHC Dash-8 and Q400.
- In addition to their mainline carriers, the regional airline affiliates of American, Delta, and United all provide service with smaller regional jets. This service is anticipated to continue in the future using aircraft with 50 to 90 passenger seats.
- This size of the regional jets use at Albany has grown in the past 10 years with the introduction of the EMB-175 and 190 in regular schedule operation, although the smaller 50 passenger CRJ-200 and EMB-145 remain in service at ALB.

Air Cargo Airlines: ALB has daily scheduled air cargo service by FedEx and UPS, and charter service by several other cargo airlines. In 2021, FedEx and UPS conducted 1,737 annual operations at ALB using Boeing 757-200 according to the FAA TFMSC, making it the Critical Aircraft for the Airfield. Past cargo operations included Boeing 727, DC-9 and other aircraft, but those have been retired for several years and replaced with the B757, which is larger and more efficient to operate.

The B757 is currently the smallest aircraft (other than feeder aircraft) in either FedEx's or UPS's fleets. It is also one of the oldest aircraft in either of their fleets, with a combined average age of nearly 30 years. The B757 aircraft are the second most prolific aircraft in FedEx and UPS's fleets, second only to the B767. Even though the B757 is no longer being produced by Boeing, both cargo airlines have indicated that they plan to continue service at ALB with the B757 for the foreseeable future.

However, FedEx has upsized service, with Sunday use of the Airbus A300 starting in March 2022. Monday through Saturday, FedEx will continue to use the B757. The A300 and B757 are both within ARC D-IV, but the A300 is a 'widebody' and 'heavy' (i.e., over 300,000 lbs. MTOW). Both cargo airlines are moving toward larger aircraft to improve operational costs and efficiency, and due to the continued growth in air freight. The A300 is a slightly larger aircraft used by both cargo airlines, and it is currently utilized at similar upstate New York State airports such as BUF, ROC, and SYR. Additional use by the A300 is possible but has not been announced at this time.

The Boeing 767 cargo aircraft is larger than both the B757 and A300, and it is replacing those aircraft even in some smaller markets. The B767 now operates regularly at ROC, SYR, and BUF, and qualified as the Critical Aircraft at BUF and ROC in 2021 with over 500 annual itinerant operations. Both cargo airlines are growing their B767 fleets, with an average aircraft age of 4-years for FedEx, and 16-years for UPS. Cargo aircraft do not have the high number of cycles as passenger aircraft, and the B767 is anticipated to remain in use over the next 20 years or more.

Although neither cargo airline has yet announced a plan to introduce the B767 at ALB, with the exception of occasional holiday period use. Upgrades to the regular use by the A300 is possible in the future, as currently observed and BUF and ROC. As such, ALB should prepare for the A300 to become the Critical Aircraft. Below is a summary of cargo aircraft applicable to ALB.

Cargo Aircraft Notes:

- The B757, A300, and B767 are all Airplane Design Group (ADG) IV. With an ARC of C-IV or D-IV. The B757 and A300 are in use at ALB currently, the B767 is not.
- The B757 has a Taxiway Design Group (TDG) of Group 4, with the A300 and B767 having a larger Taxiway Design Group (TDG) of Group 5.
- At ALB, the existing Taxiways are designed to TDG 5, with a 75' width, and can accommodate TDG 5.

Using the information described above, the recommended future critical aircraft for planning of the airfield and air cargo areas is as follows.

- Current through 2030: Boeing 757
- 2031 through 2042: The Airbus A300 may become the Critical Aircraft (but current documentation does not formally justify this change).
- After 2036: Boeing 767: Occasional use is possible, but the substantially higher cargo capacity of the B767 and the moderate forecast of cargo volume at ALB, would not require regular use by this aircraft.

The B757 and A300 are both aging aircraft and have been out of production for many years. Most aircraft analysts anticipate the Boeing and Airbus will announce a new cargo aircraft derivative that could enter service during the second half of the planning period. Speculation remains regarding if such an aircraft could be a narrowbody aircraft derivative, or a widebody aircraft based on the Boeing 787 or Airbus A350. It is possible that this new aircraft would ultimately become the Critical Aircraft at ALB; however, such an assumption cannot be used for a critical aircraft determination.

Conclusion: The critical aircraft for planning of terminal facilities is recommended to continue to be the B737-800 (ARC C-III) throughout the planning horizon. For air cargo, and the airfield as a whole, the critical aircraft will remain the Boeing 757 (ARC C/D-IV), but all airfield planning must be able to accommodate the larger Airbus A300 widebody that is in use today at ALB, and its larger TDG of 5.

4 Facility Requirements

In order to ensure that Albany International Airport (ALB) is capable of supporting the forecasted increase in aviation activity, capacity evaluations were conducted to identify recommendation facilities to adequately accommodate anticipated activity levels. The purpose of this chapter is to identify the Airport's facility development needs over the 20-year planning horizon. Using the aviation activity forecast presented in **Chapter 3**, the airport facility needs were determined, which form the basis of the development concepts that will be discussed in **Chapter 5**. In addition to capacity shortfall, this chapter review deficiencies in satisfying FAA design standard for both the airfield and terminal, air cargo, and general aviation areas.

The airport demand, capacity, design standards, and the overall facility requirements at ALB were evaluated using guidance contained in several FAA publications, including:

- Advisory Circular 150/5060-5, *Airport Capacity and Delay*
- AC 150/5300-13B, *Airport Design*
- AC 150/5325-4B*, Runway Length Requirements for Airport Design*
- AC 150/5190-4B, *Airport Land Use Compatibility Planning*
- AC 150/5360-13B, *Airport Terminal Planning*

4.1 Airfield Capacity Requirements

Airfield capacity refers to the maximum numbers of aircraft operations (takeoffs or landings) an airfield can accommodate in a specified amount of time. Assessments of the airfield's current and future capacity were performed using common methods described in FAA AC 150/5060-5, *Airfield Capacity and Delay*, and explains how to compute airfield capacity for the purposes of airport planning and design. This evaluation helped to determine if there is a need for capacity-related improvements or expansions to support future flight activity levels. The estimated capacity of the airfield at ALB was expressed in the following two measurements:

- ✈ Hourly Capacity – The maximum number of aircraft operations an airfield can safely accommodate under continuous demand in a one-hour period. This expression accounts for Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) conditions and is used to identify any peak-period constraints on a given day.
- ✈ Annual Service Volume (ASV) – The maximum number of aircraft operations an airfield can accommodate in a one-year period at an acceptable level of delay. This calculation is typically used in long-range planning and referenced for capacity-related improvement.

Capacity Calculation Factors

To calculate these two measurements of capacity, several key factors and assumptions specific to ALB were defined. Consistent with the guidance provided in AC 150-5060-5, these included:

- ✈ Aircraft Fleet Mix Index – A ratio of the various classes of aircraft serving an airport.
- ✈ Runway-Use Configuration – The number and orientation of the active runways.

<u>Aircraft Fleet Mix Index</u>

An airport's fleet mix index is determined by the size of typical aircraft and the frequency of their operations. To identify the aircraft mix index, AC 150-5060-5 has established four categories in classifying an aircraft by its maximum takeoff weight (MTOW), as depicted in Table 4-1.

Table 4-1 – Aircraft Capacity Classifications

Aircraft Class	MTOW (lbs)	Number of Engines	Wake Turbulence
A	<12,500	Single	Small (S)
B		Multi	
C	12,500 – 300,000	Multi	Large (L)
D	>300,000	Multi	Heavy (H)

Source: FAA AC 150/5060-5, CHA, 2021.

The aircraft mix index is calculated using the formula *%(C + 3D)*, the letters corresponding with the aircraft class. This product falls into one of the FAA-established mix index ranges listed below and is used in capacity calculations herein:

• 0 to 20 • 21 to 50 • 51 to 80 • 81 to 120 • 121 to 180

The current facilities at the Airport can accommodate all four aircraft classes. The following operations percentages for aircraft categories were gathered from a review of operations that occurred in 2020:

- ✈ Class A & B = 50.0 percent of the Airport's operations
- ✈ Class C = 49.9 percent of the Airport's operations
- ✈ Class D = 0.1 percent of the Airport's operations

As such, the base year aircraft mix index is **50.2** [49.9 + 3(0.1)]. By the end of the planning horizon, the aircraft mix index may potentially increase to be **56.7** [46.8 + 3(3.3)] if FedEx transitions the critical aircraft from a Boeing 757 to and Airbus A300 conducting air cargo operations. However, the lower 50.3 Index was used to ensure the airfield capacity is not provide over estimated.

Runway Use Configuration

The principal determinants of an airfield's layout or configuration are the number and orientation of runways. The efficiency and functionality of the runways used in conjunction with the taxiways and aprons during the various levels of aviation activity directly affects an airport's operational capacity.

If an airfield layout consists of more than one runway, those runways can be termed as either "independent" or "dependent" of each other. An independent runway is one that is not operationally affected by the other runways during normal operations (e.g., parallel runways with sufficient separation). A dependent runway is one that is configured in such a way that aircraft must wait for operations to complete on another runway before resuming (e.g., intersecting runways). Due to this wait time, airfields with dependent runway systems are inherently limited compared to independent runways. The intersection runways at ALB are thus dependent.

Runway 1/19 has a north/south orientation and serves as the primary runway for all airport operations. Runway 10-28 has an east/west orientation and serves as the crosswind runway.

4.1.1 Hourly Capacity

As outlined in AC 150/5060-5, hourly capacity estimates were made under the following assumptions:

- Percent Arrivals: Arrival operations equal departure operations.
- Percent Touch-and-Go Operations: Percent of touch-and-go operations is within the ranges shown in AC 150/5060-5, *Table 2-1*. As reported by the Air Traffic Control Tower (ATCT), the percent of touch-and-go operations is just a few percent at ALB. This places the airport in the lowest category of 'between 0 and 20 percent' throughout the planning period.
- Taxiways: Full-length parallel taxiway, ample runway entrance/exit taxiways, and no taxiway crossing problems. These assumptions accurately represent the taxiway layout at ALB.
- Airspace Limitations: There are no airspace limitations which would adversely impact flight operations or otherwise restrict aircraft which could operate at the Airport.
- Runway Instrumentation: The Airport has two runway end equipped with an Instrument Landing System (ILS) and has the necessary Air Traffic Control (ATC) facilities and services to carry out operations in a radar environment.

Based on the runway-way use configuration and aircraft mix index at ALB, and in accordance with FAA AC 150/5060-5, current and future hourly capacity (or operations per hour) through in 2041 under VFR and IFR conditions are approximately 74 and 57 operations, respectively, as shown in **Table 4-2**.

Table 4-2 – Capacity and ASV for Long Range Planning (ALB Hourly Capacity)

Mix Index	Hourly Capacity (Ops/Hr)		Annual Service Volume (Ops/Yr)
% (C+3D)	VFR	IFR	
0 to 20	98	59	230,000
21 to 50	**74**	**57**	**195,000**
51 to 80	63	56	205,000
81 to 120	55	53	210,000
121 to 130	51	50	240,000

Source: FAA AC 150/5060-5 [*Figure 2-1]*.

ALB's peak hourly activity in all weather conditions is forecasted to reach 24 by 2041, which is well within the maximums of both VFR and IFR conditions based on the table above. With 24 peak hour operations and an estimated capacity of 74, hourly airfield capacity would reach approximately 33%, or one-third. As such, improvements in airfield capacity are not necessary from a peak hour perspective.

4.1.2 Annual Service Volume

Annual Service Volume (ASV) is an expression of the total number of aircraft operations that an airfield can support per annum. As outlined in AC 150/5060-5, *Chapter 2: Capacity and Delay Calculations for Long Range Planning,* air service volume estimates were made under the following assumptions:

- VFR weather conditions occur roughly 77 percent of the time.
- Runway-Use Configuration: Roughly 80 percent of the time the airport is operated with the runway-use configuration which produces the greatest capacity (i.e., Runway 1-19).

Based on the runway-use configuration and mix index, the annual air service volume at ALB is estimated at 195,000 during the planning period, as shown in **Table 4-3**. With annual operations for 77,530 by 2041 time, that capacity at ALB is forecast to reach a maximum of approximately 40 percent capacity, improvements in airfield capacity are not necessary from an ASV perspective.

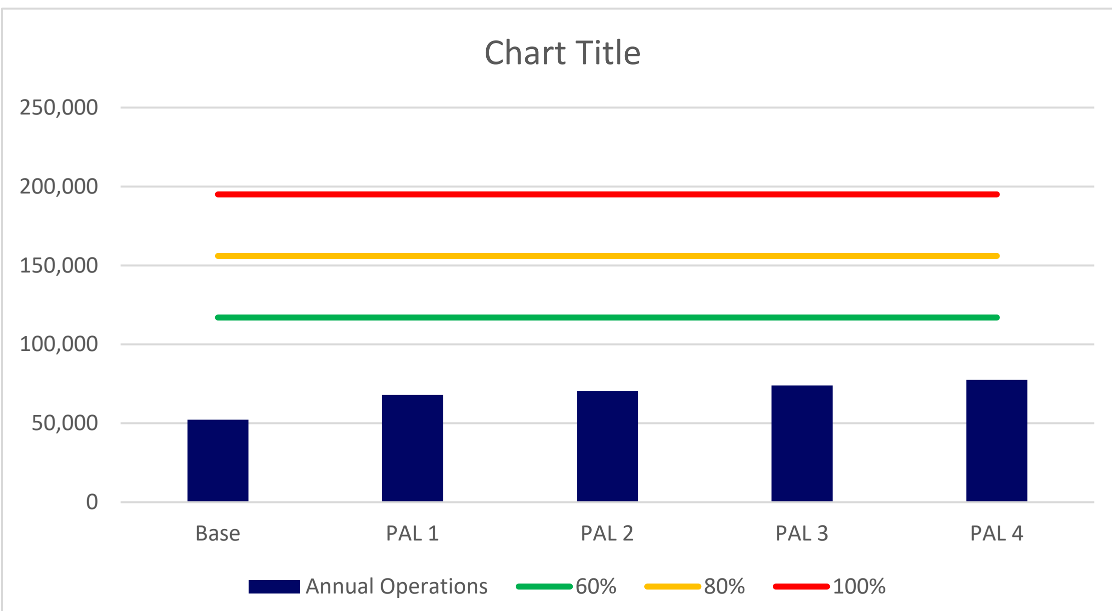
Table 4-3 – Annual Service Volume

Factor	Base	2041
Annual Operations	52,228	77,530
Annual Service Volume	195,000	195,000
Capacity Level	**26.8%**	**39.8%**

Source: FAA AC 150/5060-5 [*Figure 2-1]*, CHA

As demand increases, operational efficiency begins to decline exponentially. Delays per aircraft amount to approximately 45 seconds at around 60% capacity, 1.5 minutes at 80%, and 3.5 minutes at 100% capacity. In summary, the current runway capacity is adequate to serve the Airport's activity well beyond the planning horizon. The FAA considers airports that are forecast to remain below 60% of their hourly and annual capacities to not need planning for additional capacity. **Figure 4-1** – Projected Demand illustrates the forecast annual operations at ALB, in comparison to the 60%, 80%, and 100% capacity level. Per this analysis, ALB falls within this category of "below 60%." Therefore, identified airfield improvements focus on FAA Design Standards and safety, rather than capacity. This finding is common for small hub airports, which rarely have airfield capacity shortfalls.

Figure 4-1 – Projected Demand



Source: FAA AC 150/5060-5 [*Figure 2-1], CHA*

4.2 Airfield Facility Requirements

The above section concludes that additional airfield facilities are not needed for capacity purposes alone. This section considers potential needs for safety improvements, including FAA established design standards, which have been revised in the past several years. This review includes the three key components of the ALB airfield: Runways, Taxiways, and Navigational Aids.

Airfield facility requirements are primarily determined by the critical aircraft (aircraft with the longest wingspan, highest tail, and fastest approach speeds) that conduct "regular use" of the airport as a whole, and specific runways and terminal/landside facilities. FAA AC 150/5000-17 defines "regular use" as 500 annual operations, including both itinerant and local operations but excluding touch-and-go operations.

4.2.1 Aircraft & Airport Classification

As introduced in Chapter 2, the FAA has established aircraft classification systems that group aircraft types based on their performance and geometric characteristics. These classification systems are used to determine the appropriate airport design standards for specific runway, taxiway, aprons, and other facilities at ALB. As described in FAA AC 150/5300-13B, *Airport Design,* the standard classifications for the airfield are the Aircraft Approach Category (AAC), the Airplane Design Group (ADG), which combined comprise the Airport Reference Code (ARC). Additionally, the Taxiway Design Group (TDG) affects the requirements for taxiway width and standards. Error! Reference source not found. **Table 4-4** presents the applicability of these classification systems to the FAA airport design standards for individual airport components.

Table 4-4 – Applicability of Aircraft Classifications

Aircraft Classification	Related Design Components
Aircraft Approach Category (AAC)	Runway Safety Area (RSA), Runway Object Free Area (ROFA), Runway Protection Zone (RPZ), runway width, runway-to-taxiway separation, runway-to-fixed object
Airplane Design Group (ADG)	Runway and Taxiway Object Free Areas (OFAs), parking configuration, taxiway-to-taxiway separation, runway-to-taxiway separation
Airport Reference Code (ARC)	The combination of the AAC and ADG.
Taxiway Design Group (TDG)	Taxiway width, radius, fillet design, apron area, parking layout

Source: FAA AC 150/5300-13B, CHA, 2023.

The ARC is used for planning and design only; it does not limit the aircraft that may be able to operate safely on the airport. The specific definitions of these items were provided in Table 2-12.

The "critical aircraft" or "design aircraft family" represents the most demanding aircraft, or grouping of aircraft, with similar characteristics (relative to AAC, ADG, TDG) that are currently using or are anticipated to use the airport on a regular basis (i.e., ≥500 annual operations). The design aircraft family was identified for ALB in **Section 3.5.8**. For facility requirements planning, the critical aircraft are further reviewed and determined for each component of the airport, as discussed below.

Airfield

With existing annual operations of over 1,700, the Boeing 757 is the critical aircraft for the airport as a whole, including Primary Runway 1/19, parallel Taxiway "A", and other connecting taxiways. For Crosswind Runway 10/28, and parallel Taxiway "C", there is use by the Boeing 757, but not necessarily regular use. As such, ALB's airfield Critical Aircraft is listed below.

Table 4-5 – Airfield Critical Aircraft

Facility	Sample Aircraft	ARC	TDG
Current			
Runway 1/19	Boeing 757	D-IV	4
Runway 10/28	Boeing 737	D-III	3
Future			
Runway 1/19*	Airbus A300*	C -IV	5
Runway 10/28	No Change		

Source: FAA TFMSC flight plan database and Airport Forecast
*The potential change in the Critical Aircraft is not yet determined, or FAA approved.

The Airbus A300 is currently used weekly at ALB by FedEx, with approximately 100 annual operations. As FedEx has not determined any additional use of the A300, it is not yet known if it will become the overall critical aircraft at ALB. As such, it is important that the planning activities enable an upgrade to a future larger aircraft model with a TDG of 5 at ALB for all portions of the airfield that will accommodate TDG 5 aircraft. Taxiway widths are further discussed in **Section 4.2.6**.

Terminal / Landside Facilities

In addition to the airfield, the future terminal area facilities must consider the most demanding aircraft anticipated throughout the planning period. Based on a review of industry trends, the activity forecasts, and interviews with existing airport operators, an existing and future critical aircraft was also identified for passenger terminal apron, air cargo apron, as well as the MRO, FBO and general aviation facilities at ALB, as presented below.

Table 4-6 – Terminal/Landside Critical Aircraft

Facility	Sample Aircraft	ARC	TDG
Current			
Passenger Terminal	Boeing 737, Airbus A320	C/D-III	3
Air Cargo Area	Boeing 757	C/D-III	4
MRO Facilities	Embraer E-145	C-II	2B
FBO/Corporate	Gulfstream 550	C/D-III	2B
Light GA/T-Hangars	Cessna 172, Beach Baron	A/B-I	1A
Future			
Passenger Terminal	No Change		
Air Cargo Area*	Airbus A300*	C/D-IV	5
MRO Facilities**	Embraer E-175**	C-III	3
FBO/Corporate/GA	No Change		
Light GA/T-Hangars	No Change		

* The potential change in Critical Aircraft is not yet determined or FAA approved

**Change from E-145 to the E-175 also results in a tail height increase from 22' to 32'

In summary, as activity grows at ALB over time, a majority of the increase in activity is anticipated to consist of additional operations by the same category of aircraft. However, based on this review, there are two circumstances where potential aircraft changes will affect the facility requirements and subsequent development recommendations. These include:

- Airfield Critical Aircraft change from TDG 4 to 5 (e.g., change from B757 to A300 for air cargo). This is a potential change that is not yet confirmed. However, as cargo operators may upgrade to an A300 or other TDG 5 aircraft in the future, the airfield planning must be able to accommodate this change. Additionally, as TDG 5 aircraft conduct weekly operations at ALB currently, taxiways that do not accommodate that size aircraft may prevent or eliminate that existing activity.

- The two MRO Facilities operated by Piedmont and Commute Air both exclusively operate EMB-145 regional jet aircraft in ARC C-II. However, during the planning period, both existing MRO facility operators anticipate aircraft upgrade at ALB to EMB-175 in ARC C-III. Thus, the planning for these facilities must consider the larger wingspan and tail heights that will need to be accommodated. At the airport as a whole, other regional airlines have already converted to larger jets, and the number of EMB-145 operations has declined at ALB.

4.2.2 Runway Requirements

As part of this master plan, FAA runway design and safety standards were evaluated to identify potential deficiencies to be addressed in the study. The FAA standards include dimensions, separation distances, protection zones, etc.

Each runway is assigned a Runway Design Code (RDC), which signifies the design standards specific to the individual runway. As detailed in **Chapter 3, *Forecast***, the overall Airport Reference Code (ARC) is currently D-IV. Runway 1/19 contains Instrument Landing Systems (ILS) with visibility minimums as low as 1,200 feet. The RDC is simply the ARC with the lowest available visibility added. As such, the Runway 1/19 RDC is D-IV-1200. The 4-digit number represents the minimum visibility of any published instrument approach on either end of the runway. With Runway 10/28 used regularly by ARC C-III aircraft and a 1-mile visibility minimum, the Runway 10/28 RDC is listed as C-III-5000. However, existing small hills beyond the east and west ends of the runway prevent lower visibility minimum for C and D aircraft on Runway 10-28 (i.e., existing visibility minimums for C & D aircraft are ≥1-5/8 miles. While reduced visibility would be desirable on Runway 10-28, it does not appear feasible per existing terrain. As such, the future ARC and visibility minimums are not anticipated to change on either runway during the planning period.

The key FAA design and safety standards related to the runways at ALB, as defined in AC 150/5300-13B, *Airport Design*, are described below.

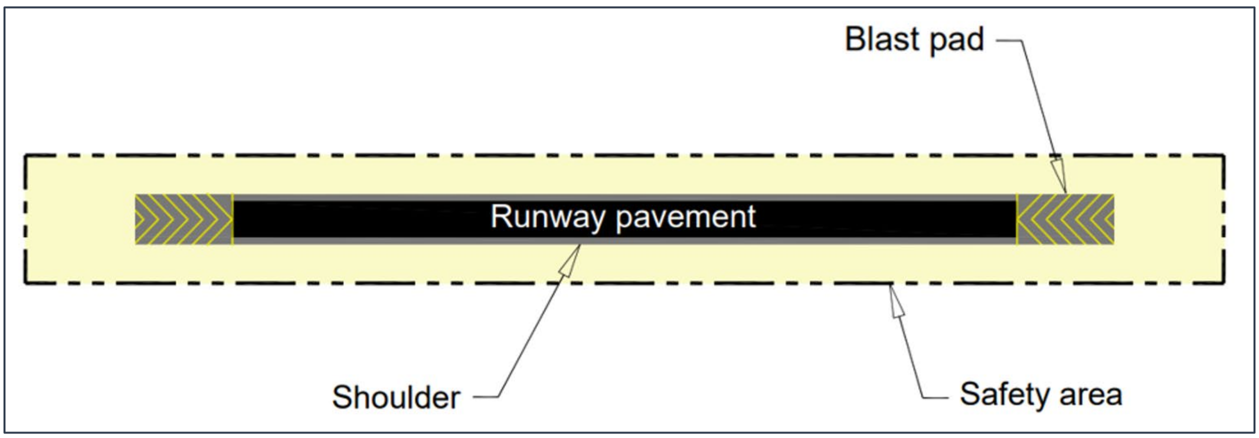
Runway Width – Runway width requirements are based on the critical aircraft associated with each runway. For ARC C-III through D-IV, the required runway width is 150 feet. Currently, both Runways 1/19 and 10/28 are 150 feet wide, thereby meeting this design requirement.

While Runway 10/28 currently accommodates regular use by ARC C-III aircraft, FAA policy defines the circumstances when a crosswind runway is federally eligible. At ALB, ‘primary’ Runway 1/19 provide >95% wind coverage for C and D aircraft; therefore, in accordance with the FAA Airport Improvement Program (AIP) Handbook, Order 5100.38D, a crosswind runway is not generally eligible for these larger aircraft. Per this policy, the Runway 10/28 width could be limited to only 75 feet, which contrasts with the existing ARC C-III aircraft activity demonstrates on Runway 10-28.

As the Runway 10/28 width has been 150 feet for decades and is often used by C and D aircraft during strong westerly winds (approximately 1,000 annual operations), the FAA has funded multiple rehabilitations of the runway surface at the existing width, including most recently in 2023. The practice is permitted by current AIP policy and retaining the existing infrastructure (i.e., crosswind runway width) is recommended throughout the planning period. However, if runway or taxiway reconstruction became necessary (as compared to a simpler rehabilitation), AIP policy would limit eligibility to providing only ARC B-II standards on Crosswind Runway 10/28 (i.e., 75' runway width, 35' taxiway width) due to the good Runway 1/19 wind coverage.

Runway Safety Area (RSA) – The RSA is a rectangular area bordering a runway that is intended to reduce the risk of damage to aircraft in the event of an undershoot, overrun, or excursion from the runway, as illustrated below. The RSA is required to be cleared and graded such that it is void of potentially hazardous ruts, depressions, or other surface variations. Additionally, the RSA must be drained by grading or storm sewers to prevent water accumulation, be able to support snow removal and firefighting equipment, and be free of objects except those required because of their function.

Figure 4-2 – Runway Safety Area



Source: FAA AC 150/5300-13B

The RSA for a Group IV runway is required to be 500 feet wide and extend 1,000 feet beyond the runway end, with gradients as follows:

- Longitudinal: First 200 feet: 0 percent to -3.0 percent
- Longitudinal: Remaining 800 feet: No more than -5.0 percent
- Transverse grades: -1.5 percent to -3.0 percent

The Runway 1/19 RSA meets the length, width, and general grading requirements of the RSA, with longitudinal grades remaining under 2 percent. However, the general flat terrain surrounding the runway results in a few locations with a transverse grade of less than 1.5 percent. This has resulted in some standing water in the RSA on the south end of the runway. Recently, the airport completed drainage improvements to reduce temporary standing water in the RSA.

The Runway 1 end contains a PAPI power unit within the RSA. However, the current PAPI model (L-880/L-881) was installed in January 1998. The model requires the power unit to be as close to the light housing units as possible. Per the user manual of the L-880/L-881 PAPI model, if the siting location of the light housing units results in the power unit being within the RSA, it must be placed on frangible mounts. As this is the case with the Runway 1 PAPI power unit, no further mitigation action is required.

Runway 10/28 meets the gradient requirements of the RSA and satisfies the dimensional standards through the application of declared distances and a displaced threshold on the east end of the runway as validated by the FAA RSA Determination dated April 2002. The location of public roads east of the runway prevents a full 1,000-foot RSA beyond the runway end, as shown below.

Table 4-7 – Runway 10/28 Declared Distances

TORA	Runway 10	Runway 28
TORA	7,200’	7,200’
TODA	7,200’	7,200’
ASDA	6,780’	7,200’
LDA	6,780’	6,007’

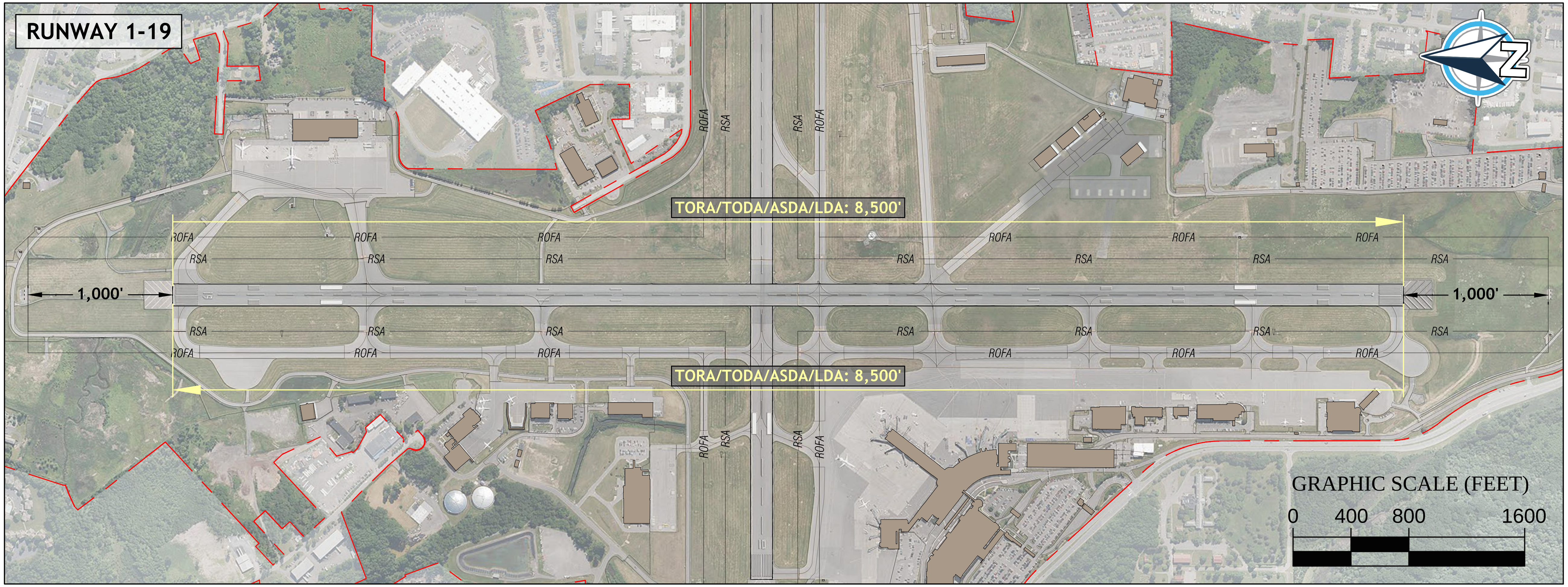
Source: Airport Master Record

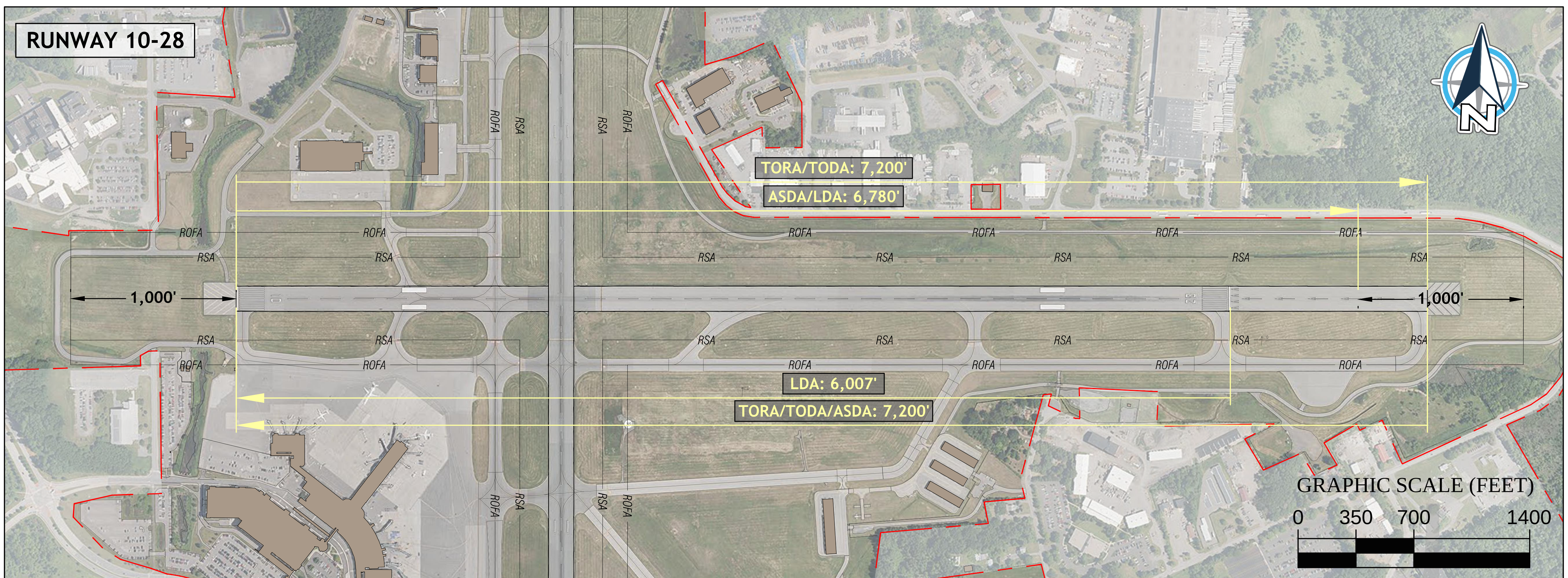
<u>RSA Determination Review</u> – The original FAA RSA determination was approved in early 2002, over 20-years ago, and the approval was based on planned Runway 10-28 improvements that were completed in 2003. As such, the master plan reviewed the current of RSA Determination with respect to current FAA design standards and facility requirements.

As stated above, Runway 1/19 meets FAA RSA standards and no improvements are necessary. However, Runway 10/28 requires the above declared distances for the RSA determination. The review conducted for this master plan recommends the retention of the existing published distances to satisfy RSA requirements and concludes the project to improve the RSA to standards conditions is not feasible or necessary.

Runway 10 operations require declared distance due to the location of the airport service road, security fence, and public roads on the stop-end of the runway (east end). The Runway 10 ASDA and LDA are reduced by 420’ to 6,780’. In order to provide a full 1,000’ long RSA, relocation of public road onto private property within mapped wetlands would be required. The service road and fence would also need to be relocated. The master plan review has identified that, based on prevailing winds, operations on Runway 10 are very rare and mostly for pilot convenience. Thus, there is little need or benefit to airport users for such improvements, and the associated impacts and costs would be considerable.

Runway 28 operations require the existing 1,200’ displaced threshold, which limits LDA to 6,000’. This condition has not changed as it is due to a small hill locate 0.9 miles east of the threshold. The hill contains homes, utility poles and trees that prevent removal or reduction of the displaced threshold. In 2022, off-airport selective tree removal was completed to maintain the existing approach and minimums. In 2023, the Airport completed a Runway 28 PAPI replacement which included an obstruction review. The new PAPI provides for a 3.2-degree approach angle to the existing displaced threshold. This review concludes that additional improvements to that approach are not practical based on the terrain, property ownership, and costs. Fortunately, as Runway 28 is the crosswind runway, used during strong westerly winds, the LDA of 6,000’ is general adequate for airport users. **Figure 4-3** depicts the published Declared Distances for both runways.





ALBANY INTERNATIONAL AIRPORT

Figure 4-3
Declared Distances

Runway Object Free Area (ROFA) – The ROFA is a rectangular area bordering a runway intended to provide enhanced safety for aircraft operations. The ROFA is an area clear of parked aircraft or other equipment not required to support air navigation or ground maneuvering of aircraft. The ROFA design standard for Group III and IV runways is 800 feet wide, centered about the runway, and extends 1,000 feet beyond each runway end. Both ALB runways generally adhere to the prescribed ROFA geometry.

However, the supplemental windsocks serving each runway end are within the limits of the ROFA. As there is limited amount of available space on the airfield that is both outside the limits of safety areas and within the sightlines of pilots conducting landing operations, the supplemental windsocks are to remain at their current locations.

Additionally, the airport service road is within the limits of the ROFA in a few locations, including beyond the north end of Runway 19 and west end of Runway 10 (see **Figure 4-4A**). In these locations, the service road was located closer to the runway to avoid filling of regulated wetlands. The nonstandard ROFA conditions illustrated in Figure 4-4 were issued an FAA Modification to Design Standards in 2002. To protect the wetlands, it is recommended that the Modification should be recertified for the service road.

However, in addition to the service road, a small portion of the employee parking lot, Hockey Lane (a County road), and the airport security fence are located within the ROFA. The master plan recommendations therefore include relocation of these items from the ROFA, likely as part of the next rehabilitation of those overall facilities. As an alternative, Declared Distances could be considered to retain those facilities in the current location; however, due to the impacts to the available runway lengths, that would not be practical. As shown is **Figure 4-4B**, to retain the parking lot and other facilities, the ROFA must be shifted 700 to the east. To provide the standard 600' ROFA prior to landing, the Runway 10 threshold would be displaced by 300'. More critically, to provide for a 1,000' ROFA on the 'stop end' of Runway 28, 700' of runway would be declared unavailable for Runway 28 LDA and ASDA. The reduced runway distances would include the following:

- Runway 10 LDA would be reduced from 6,780' to 6,480'
- Runway 28 LDA would be reduced from 6,007' to 5,307'
- Runway 28 ASDA would be reduced from 7,200' to 6,500'

These reduced declared runway lengths would substantially restrict the existing commercial jet activity on Runway 28. This option was rejected from further consideration.

Runway Object Free Zone (ROFZ) – The ROFZ is a volume of airspace centered above the runway that is required to be clear of all objects, except for frangible navigational aids that need to be in the ROFZ because of their function. The ROFZ provides clearance protection for aircraft landing or taking off from the runway. The ROFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The ROFZ extends 200 feet beyond each end of the runway, and its width is based on visibility minimums and aircraft size. The ROFZ width for Runways 1/19 and 10/28 is 400 feet and satisfies FAA standards.

Figure 4-4 – Runway 10 RSA and ROFA

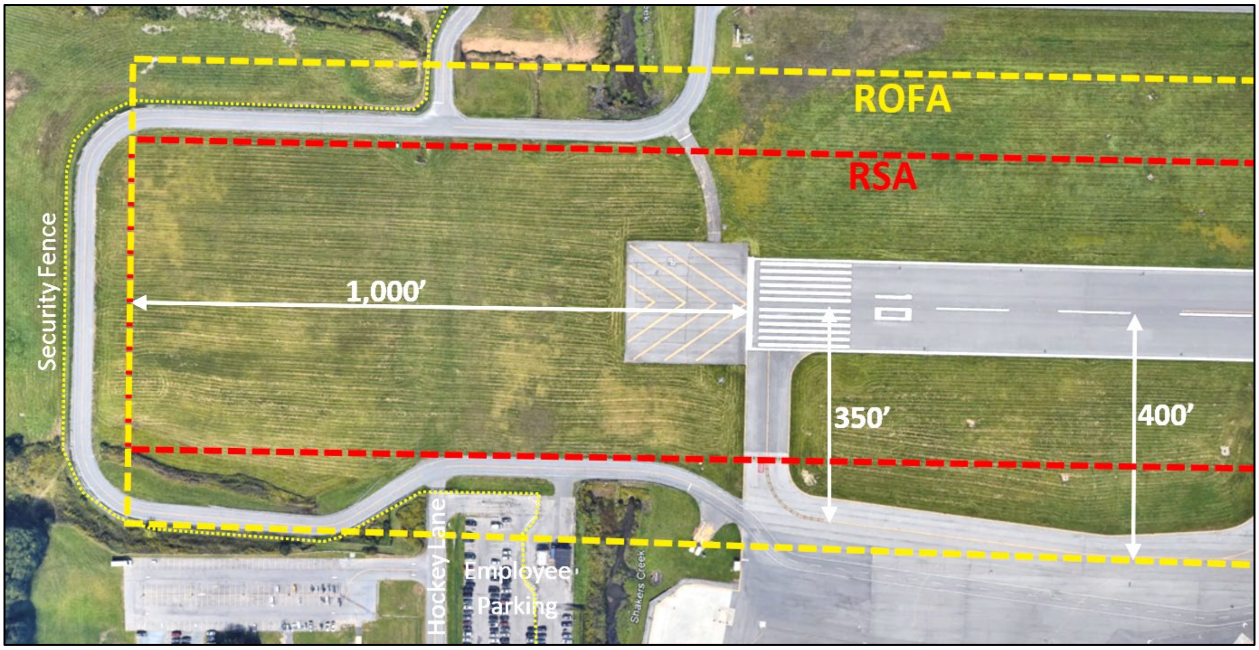
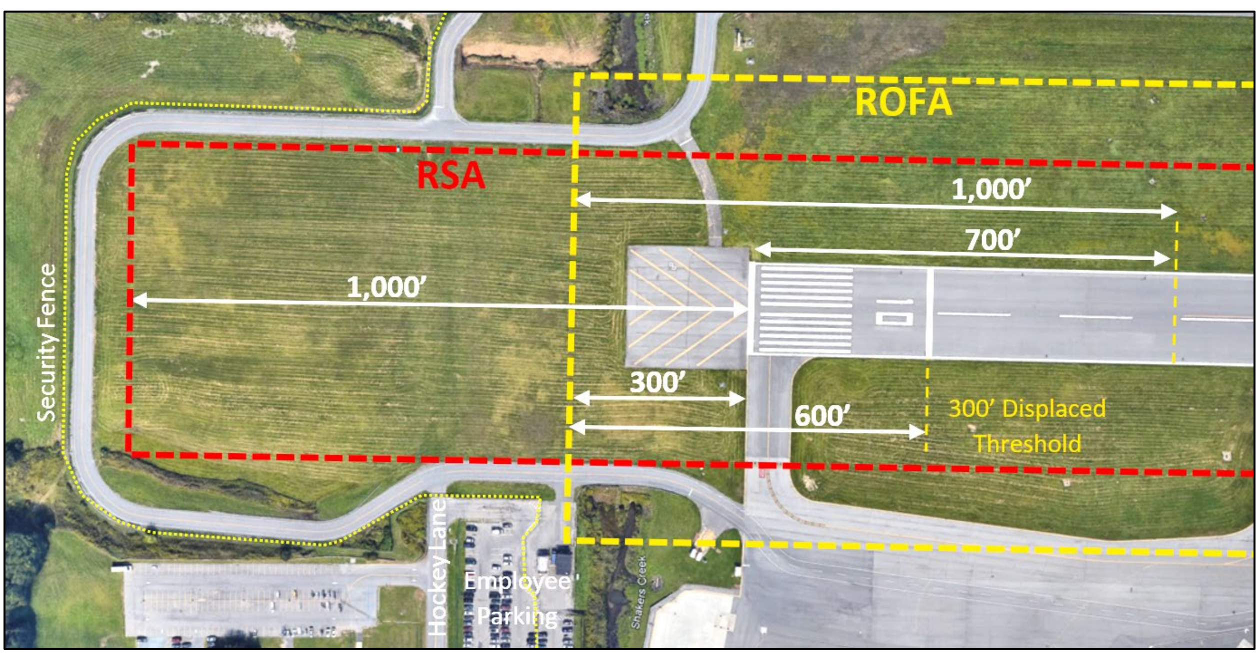
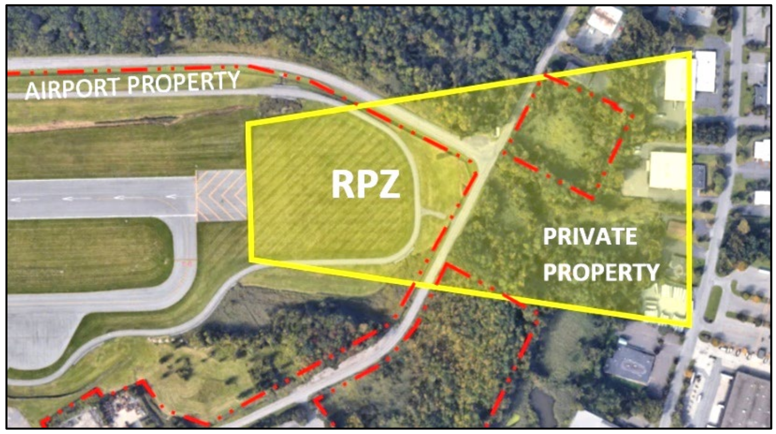


Figure 4-5 – Runway 10 RSA and ROFA (Declared Distances)



Runway Protection Zone (RPZ) – The RPZ is a trapezoidal area located 200 feet beyond the runway ends and centered on the extended runway centerline. The RPZ is primarily a land use control area that is intended to enhance the protection of people and property on the ground through airport control. Such control includes clearing of RPZ areas of incompatible objects and activities. Currently, the RPZs at ALB are primarily owned by the airport, or controlled by easements. However, as common to many airports, public roads transverse each of the RPZs at ALB.

Figure 4-6 – Runway 10 Departure RPZ



Where feasible, it is recommended that the Airport continue to acquire private land located within the RPZ's. The area beyond the east end of the runway contains several acres of private property that should be considered for acquisition and will be identified in the Development Alternatives chapter. As this runway end includes a displaced threshold and declared distances, both an Approach and Departure RPZ are depicted.

Runway Separation – Adequate runway separation is critical to the safety of aircraft operations and is a measurement of distance from the runway centerline to adjacent airfield facilities (i.e., taxiways and aircraft parking aprons). The key separation standards for ARC D-III and D-IV Include:

- Runway Centerline to Parallel Taxiway Centerline: 400 feet
- Runway Centerline to Aircraft Parking Areas: 500 feet

One location at ALB that does not satisfy these separation requirements is Runway 10 and Taxiway 'C', where the separation narrows from the standard 400 feet to approximately 350 feet toward the east end of the runway (see **Figure 4-6**). In this location, the proximity of the adjacent terminal apron prevents a standard separation between Parallel Taxiway 'C' and the apron. Therefore, this area of the taxiway is a non-movement area not under the control of the ATCT. Alternatives to increase the Runway Centerline to Parallel Taxiway Centerline separation should also evaluate and address the lack of separation to the apron.

4.2.3 Crosswind Runway Requirements

As discussed above, Runway 10/28 serves as the crosswind runway for ALB. It is oriented 90 degrees relative to primary Runway 1/19, thus providing ideal wind coverage for the overall airport. As a result, the combined wind coverage at ALB from both runways is over 95 percent for all weather conditions and aircraft types.

Wind conditions affect all airplanes in varying degrees, with smaller airplane operations generally being more affected by crosswinds. A detail crosswind evaluation was conducted and provided in Section 2.3.3, and is used here to identify the need for crosswind Runway 10/28 per FAA standards. Crosswind runways are justified (and eligible for federal funding) when the wind coverage on the primary runway is less than 95 percent. Table 4-7 identifies the all-weather wind coverage on primary Runway 1/19.

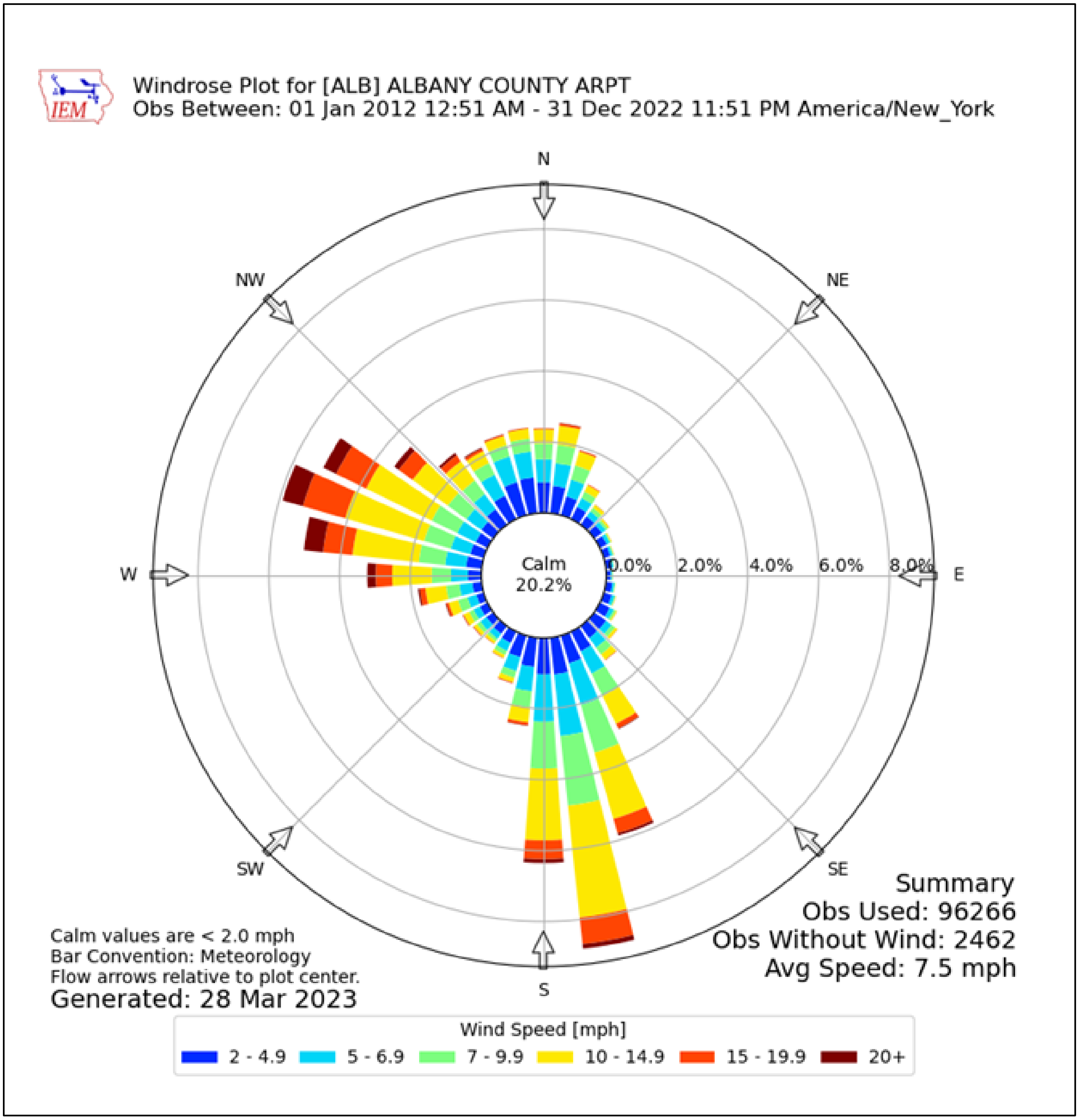
Table 4-8 – Primary Runway 1/19 Wind Coverage

Aircraft Type	ACR	Crosswind Component	Wind Coverage
Light aircraft	Up to B-I	10.5 knots	90%
Turboprops & Light Jets	A-II & B-II	13 knots	94%
Corporate & Regional Jets	C/D-II, C/D-III	16 knots	98%
Commercial Jets	ADG IV & Up	20 knots	100%

Source: NOAA, ALB ASOS 2010-2019.

Based on local winds, a crosswind runway at ALB is needed and eligible for general aviation aircraft including light jets up to ARC B-II. Runway improvements to crosswind Runway 10/28 would not typically be needed for larger aircraft as wind coverage on Runway 1-19 is adequate; however, the current Runway 10/28 size should be maintained as large jets use the runway 5-10% of the time due to strong westerly winds as illustrated in **Figure 4-7**. It would not be FAA eligible to expand/improvement Runway 10-28; however, maintaining and rehabilitating the existing pavement surface has continued with FAA funds in order to preserved existing runway infrastructure. As discussed above, rehabilitation projects allow for existing facilities to be rehabilitated to current widths with AIP funding, even if they exceed standards. If full reconstruction was required, the facilities could be narrowed or the Airport could choose to fund the additional width that is above standards.

Figure 4-7 – ALB All-Weather Wind Graph



Source: Iowa Environmental Mesonet (IEM), Iowa State University, 2023

Interviews with ALB operations personnel raised questions regarding the above finding, noting that strong westerly winds, particularly in winter months result in significant use and need for Runway 10/28, including for jet aircraft. As such, an additional wind analysis was conducted using the same ALB data set, but with restricting the observations to the colder six months of the year (October through March), and to the hours of the day containing scheduled commercial operations (5 AM to Midnight). This alternative wind analysis demonstrated a lower wind coverage on Runway 1/19 and the need for crosswind Runway 10/28 for all passenger airline activity with wind coverage under 95%.

Table 4-9 – Modified Primary Runway Wind Coverage

Aircraft Type	ACR	Crosswind Component	Wind Coverage
Light aircraft	Up to B-I	10.5 knots	86%
Turboprops & Light Jets	A-II & B-II	13 knots	90%
Corporate & Regional Jets	C/D-II, C/D-III	16 knots	94%
Commercial Jets	ADG IV & Up	20 knots	98%

Source: NOAA, ALB ASOS 2010-2019, limited to October – March and 5 AM to Midnight.

Based on these findings, it is recommended that the airport maintain crosswind Runway 10/28 in its current configuration throughout the planning period, to enable regular use by airline jets.

4.2.4 Runway Length Requirements

To ensure that ALB can support existing and anticipated aircraft and airline operational demands, a limited runway length analysis was performed based on specific aircraft performance characteristics as documented in the manufacturer's Aircraft Planning Manuals (APMs). Inadequate runway length can limit the operational capability of an airport, including the aircraft types that can operate and the destinations (i.e., stage lengths) that the airport serves. Runway lengths can place restrictions on the allowable takeoff weight of the aircraft, which reduces the amount of fuel, passengers, or cargo that can be carried. Per the guidance provided in AC 150/5325-4B, *Runway Length Requirements for Airport Design*, the following factors were used in the runway length calculation for ALB:

<u>Aircraft Specifics</u>

- Model and Engine Type – the aircraft version and engine type. The most common and demanding aircraft specific to ALB were used.

- Estimated Takeoff Weight – the estimated weight at takeoff, which includes the payload (i.e., passengers and baggage) and the fuel required to reach the intended destination (with reserve fuel).
- Estimated Landing Weight – the estimated weight at landing. For this analysis, maximum landing weight (MLW) was used to determine runway landing requirements.
- Landing Wing Flap Setting – the change in the wing angle to allow for lower airspeed operations. For this analysis, Flaps 15 was used as a worst case scenario. It is important to note that standard landing operations typically utilize a higher setting (between Flaps 25 and Flaps 40) which results in shorter runway length requirements.

Airport Specifics

- Temperature – the atmospheric temperature at the airport. Warmer air requires longer runway lengths because the air is less dense, thus generating less lift on the aircraft. The "Standard Day (59°F) + 25°F" (i.e., hot temperature of 84°F) methodology listed in each aircraft manufacturer's specific APMs was used. The FAA uses the parameter of 25°F above standard for planning purposes.
- Elevation – the elevation above sea level at the airport. As elevation increases, air density decreases, making takeoffs longer and landings faster. ALB is located 285 feet above mean sea level (MSL). Sea level elevation was used for calculation due to manufacturer APMs using 1,000-foot increments.
- Stage Length (flight distance) – the length in nautical miles (nm) to the intended destination. The stage length determines the amount of fuel an aircraft will require on takeoff to complete its flight, thus impacting aircraft weight and runway length requirements.

Existing Aircraft and Destinations

Two representative aircraft were used for this evaluation: the Boeing 737 Max 8 for commercial passenger service, and the Boeing 757-200 for air cargo operations. The 757 is the Critical Aircraft as the largest and heaviest regular user at ALB. The 737 Max 8 is the most demand aircraft, from runway length standpoint, in regular use at ALB. The assumptions for each aircraft are outlined below.

Boeing 737 Max 8 – For the runway takeoff length analysis, a stage length of 2,500 nautical miles (nm) was used as a most-demanding scenario with 90 percent maximum payload capacity. This stage length would allow for nonstop service to any airport within the contiguous United States. For the runway landing length analysis, the Maximum Landing Weight (MLW) was used.

Boeing 757-200 – For the runway takeoff length analysis, a stage length of 1,000 nm was used with 90 percent maximum payload capacity. This stage length encompasses operations to and from both hubs of UPS in Louisville, KY and FedEx in Memphis, TN. For the runway landing length analysis, the Maximum Landing Weight (MLW) was used.

Runway Length Requirement

Based on the parameters discussed above the runway length calculations and requirements for ALB are shown below.

Table 4-10 – Takeoff and Landing Weights

Aircraft	Takeoff Weight (90% Max Payload) (Pounds)	Landing Weight (Max Landing Weight) (Pounds)
Boeing 737 Max 8 (LEAP 1B Series Engines) – ALB-LAX	175,000	152,800
Boeing 757-200PF (PW2037/2040 Engines) – ALB-MEM	218,000	210,000

Source: Aircraft Performance Manuals (B737 MAX, B757), CHA, 2023.

Table 4-11 – Runway Length Requirements

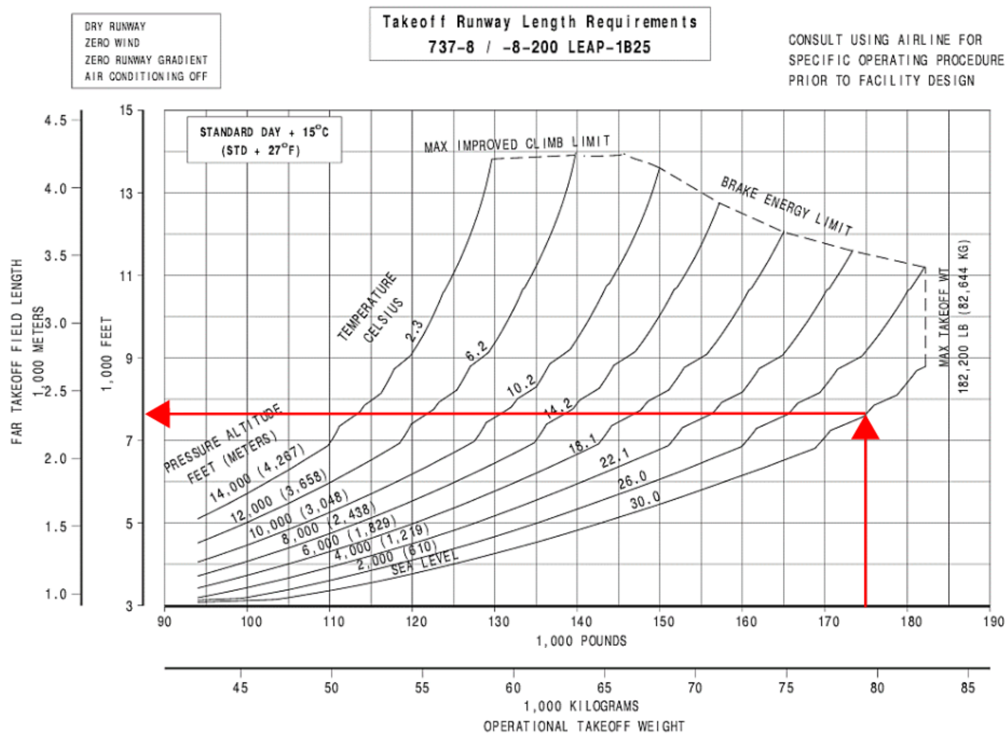
Aircraft	Takeoff Length Requirement (Feet)	Landing Length Requirement (Feet)
Boeing 737 Max 8 (LEAP 1B Series Engines) – ALB-LAX	7,700	5,900
Boeing 757-200PF (PW2037/2040 Engines) – ALB-MEM	5,800	5,100

Source: Aircraft Performance Manuals (B737 MAX, B757), CHA, 2023.

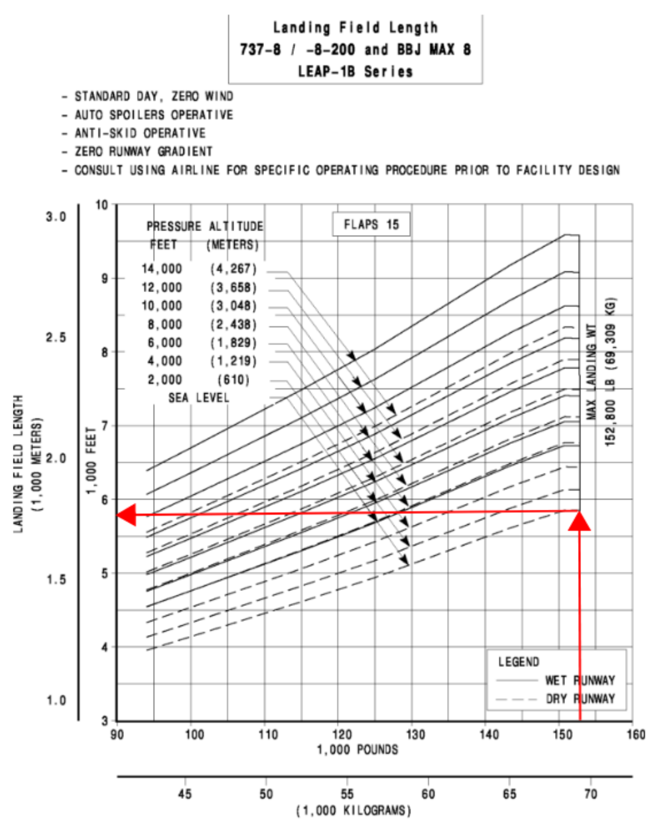
It is pertinent that these calculations represent a worst-case scenario. Currently, the farthest nonstop service from ALB is to Denver International Airport, a distance of 1,400 nm. The pre-COVID non-stop destination of Las Vegas was the longest regular flight at ALB with a distance of approximately 2,000 nm. As such, a future potential stage length of 2,500 was used as a worst case (e.g., distance to Los Angeles, Seattle), along with the 90% payload and high temperatures. **Figure 4-8** illustrates these calculations for the Critical Aircraft (i.e., Boeing 737-Max 8), confirming that runway lengths are adequate.

Figure 4-8 – Boeing 737 Max 8 Takeoff and Landing Length Requirements

3.3.10 FAA/EASA Takeoff Runway Length Requirements - Standard Day + 27°F (STD + 15°C), Dry Runway: Model 737-8 / -8-200 (LEAP-1B25 Engine)



3.4.4 FAA/EASA Landing Runway Length Requirements - Flaps 15: Model 737-8 / -8-200 / BBJ MAX 8



Conclusion

Based on the calculations from the aircraft manufacturer's APMs, the primary runway length should be a minimum of 7,700 feet. As 8,500 feet is available, this provides a buffer for departures with over a 90% payload and/or temperatures above 84°F. The crosswind runway would also ideally provide 7,700 feet of runway available for takeoff. However, as Runway 10/28 is typically only used during westerly winds (a headwind that reduces runway length requirements), the existing 7,200-foot length is considered adequate. Landings generally require less runway length than takeoff, as was determined in this evaluation for ALB.

Therefore, it is concluded that the current runway lengths at the airport are adequate to serve existing activity, forecast growth, and future non-stop destinations that may occur during the planning period.

NYS Runway Length Comparison

New York State contains six small-hub commercial service airports, including ALB, as defined by the passenger activity levels. These airports serve a few international destinations, in Canada, Mexico, and the Caribbean; however, the longest non-stop destination from these six airports is the U.S. West Coast, including Las Vegas, Phoenix, and Los Angeles. These destinations require the longest takeoff runway length due to the required fuel load. In general, to serve these destinations, a runway length of 8,000 feet is usually adequate for the modern Boeing 737 and Airbus 320 series aircraft that can fly these stage lengths.

With an existing Primary runway length of 8,500 feet, ALB's runway length is considered adequate to service additional destinations, with longer stage lengths, which may occur during the planning period. Below is a comparison of the longest available runway lengths at the six small-hub airports in the State.

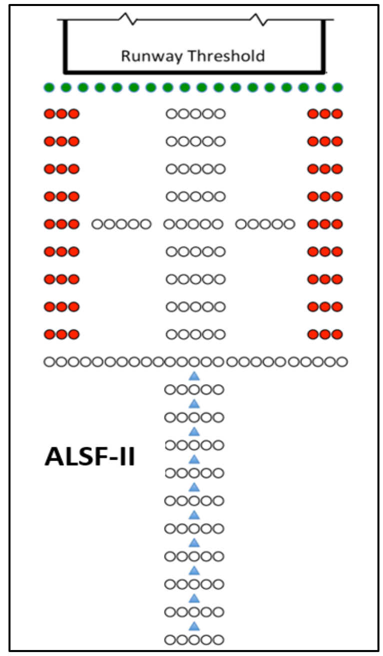
- Westchester County Airport (HPN): 6,500 Feet
- Long Island MacArthur (ISP): 7,000 Feet
- Greater Rochester International (ROC): 8,000 Feet
- **Albany International (ALB): 8,500 Feet**
- Buffalo-Niagara International (BUF): 8,800 Feet
- Syracuse-Hancock International (SYR): 9,000 Feet*

*Served F-16 fighter jets and other military aircraft.

4.2.5 Navigational, Landing, and Lighting requirements

Pilots utilize a variety of navigational aids (NAVAIDs), visual aids (VISAIDS) and instrument approach procedures to safely operate at commercial airports. These include Instrument Landing Systems (ILS), Area Navigation (RNAV) GPS, and Very High Frequency (VHF) Omni Direction Range (VORs), as well as runway and approach lighting systems (ALS). By providing navigation and position data, these systems assist pilots to locate airports, approach and land aircraft, taxi, and depart safely and efficiently during nearly all meteorological conditions.

The VOR at ALB is old, with a poor signal that is susceptible to interference. The VOR is still used by the Military for training but is becoming obsolete. Discussion with FAA have included the potential to deactivate and demolish the VOR at some point after 2026, with or without replacement. Airport management supports this plan, as the vast majority of navigation has transitioned to GPS-based systems. A summary of the facilities currently provided and future requirements is provided below.



Instrument Landing Systems (ILS) – At ALB, both ends of Runway 1/19 are equipped with an ILS providing standard minimums, with a decision height of 200 feet, and visibility minimum of ½ mile. The ILS is a precision instrument procedure providing both horizontal and vertical guidance to the runway end. At ALB they include the following set of equipment:

- Localizer (LOC), for electronic lateral guidance
- Glide Slope (GS), for electronic vertical guidance
- Medium Intensity Approach Lighting Systems with Runway Alignment Indicator Lights (MALSR), for visual reference to the runway end. The existing Runway 1 MALSR at ALB is in very poor condition as determined in the 2022 *ALB Runway 1 MALSR Condition Assessment Report*
- Inner marker beacon, for audio reference
- Runway Visual Range (RVR), providing runway visibility at both the touchdown and rollout positions
- High Intensity Runway Lights (HIRL)

Additionally, Runway 1 provides ILS Category (CAT) II capability, adding Touchdown Zone Lights and Runway Centerline Lights, which reduces the decision height to 100 feet, with a visibility minimum of only ¼ mile or 1,200 feet.

Requirement: The standard approach light system for ILS Category II requires a more substantial system called an Approach Lighting System with Flashing Lights for Category II (ALSF-II). This lighting system contains three rows of light bars and closer spacing than a MALSR and provides substantially enhance visual reference at night and in poor visibility. Ideally, an ALSF-II would be provided on Runway 1 to replace the existing MALSR system that is in poor condition. ALSF-II systems are currently in place at similar airports, including: SYR, ROC, and BUF.

However, the existing ILS approach to Runway 1 has a Special Authorization (SA) CAT II approach that enables CAT II minimums with only a MALSR system. With the SA, a MALSR is considered an adequate and lower cost alternative to adding a full ALSF-II system. Therefore, it is recommended that the existing Runway 1 MALSR system be fully replaced in kind, as long as the existing minimums (i.e. 100 feet decision height and 1,200 feet visibility) are maintained throughout the planning period.

Non-precision Instrument Approaches (NPI) – All four runway ends at ALB include a published RNAV GPS procedure. The RNAV approaches procedures are based on satellite radio signals, and do not require ground base navigational equipment. The RNAV procedures for Runway 1, 19, and 28 each include vertical guidance with an LPV approach. Runway 10/28 also provide HIRL and Centerline Lights. A VOR based procedure is also available to Runway 28 using the ALB VORTAC.

These NPI procedures provide sufficient backup and an alternative to the ILS procedures. No additional systems or procedures are recommended at ALB.

Visual Aids – The airport is also equipped with several additional systems, these include:

- Precision Approach Path Indicators (PAPI) are provided on Runways 1, 19, and 28 and provide a visual reference to the standard approach slope to the runway end. PAPI systems ensure clearance over any obstacles in the final approach path using a set of lights that identify if the aircraft it above, on, or below the designated glide path.
- Runway End Identification Lights (REIL) are a set of strobe lights positioned at the runway ends to better identify the location of runway threshold during reduced visibility conditions. REIL are available on Runways 10 and 28, where full approach lighting systems are not available.
- Airport Rotating Beacon is required at all airports with runway lighting. The beacon can be seen from up to 20-miles from the airport and is used at night to provide an early visual identification of the airport’s location.

Airfield Signage & Marking – FAA guidance includes detailed Advisory Circulars on airport signage and marking. As required by the FAR Part 139 Certificate, ALB maintains a detailed plan for signage and marking, and satisfies the associated facility requirements.

Recommendation: An ALSF-II approach lighting system or replacement MALSR is recommended for Runway 1 (if minimums can be maintained). No other navigational or lighting deficiencies were identified.

4.2.6 Taxiway Requirements

Taxiway Design Standards

Similar to runways, taxiways include FAA design requirements such as dimensions, separation distances, and safety standards. The FAA standards for taxiways are also defined in AC 150/5300-13B, Airport Design, and are described below.

Taxiway Width – Taxiway width and standards are based on an airport's Taxiway Design Group (TDG), which is currently a TDG 4 for the ALB airfield as a whole. The FAA standard taxiway width is 50 feet for TDG 4. Presently, all taxiways at ALB meet or exceed this required width, as most of the taxiways at ALB are currently 75 feet in width.

As discussed above, the Airbus A300 is a weekly user of the airport in TDG 5, but is not the designated critical aircraft. The A300 requires the 75-foot wide taxiways, creating a situation where the facility requirement per FAA standards is not adequate for a current airport user. Therefore, and as the existing taxiways are 75' wide, the facility recommendation is to retain these taxiways at 75' wide, although this is above the standard for TDG 4. Reducing existing taxiway widths could be a safety concern for TDG 5 aircraft, and could potentially prevent use of the A300 aircraft at ALB. Additionally, proposed taxiway alternatives servicing the Cargo Apron would require planning for TDG 5 taxiways at 75' widths as discussed below.

Parallel Taxiways – Full parallel taxiways are considered a standard safety facility, providing access to and from runways, and preventing the need to 'back-taxi' on the runway for takeoffs or landings. Both runways at ALB are equipped with a full parallel taxiway.

As Runway 1/19 has aircraft facilities positioned on both sides of the runway, a full parallel taxiway is recommended for the east side of the runway. Currently, the air cargo, general aviation, and Army National Guard facilities are located on the east side of the runway. In order to access parallel Taxiway 'A', these users must taxi across the primary runway for most takeoffs and landings, which can be eliminated with the second parallel taxiway. FAA Advisory Circular 150/5300-13B (Paragraph 4.8.1) recommends minimizing the number of runway crossings for greater efficiency and to reduce the potential conflict points. Runways with instrument approaches and low visibility minimums further benefit from eliminating crossings.

It is anticipated that the majority of new development on the airport property will be located on the east side of Runway 1/19. While facilities improvements are anticipated in all locations throughout the planning period, new or expanded corporate, general aviation, air cargo, and support facilities will be focused on the east side of the airport as the only sizable undeveloped area of the Airport. Thus, the safety benefit of the second parallel taxiway will increase as new facilities are added at ALB.

The critical aircraft at ALB requires a minimum taxiway width of 50'. However, for long-term planning purposes, it is recommended that a potential width of 75' remain as a possibility in the future. In 2022, FedEx initiated weekly flights using Airbus A300 widebody aircraft with TDG 5. This aircraft requires 75' wide taxiways; FedEx will not operate that aircraft on a 50' wide taxiway per policy. It is not known if A300 service will eventually become regular use at ALB, but the taxiway layout should accommodate this potential future need.

Taxiway Safety Area (TSA) and Taxiway Object Free Area (TOFA) – Similar to the RSA and ROFA, taxiways also have designated standards to improve safety during an excursion from the taxiway and to provide adequate wingtip clearance from other aircraft and fixed or movable objects. The

TSA and TOFA are based on the prescribed ADG of IV at ALB. Presently, all taxiways at the Airport contain the required TSA and TOFA dimensions without impacts in most areas of the airport. As the ADG is expected to remain Group IV throughout the planning horizon, no additional requirements are necessary to meet future standards.

<u>Taxiway Fillets</u> – For taxiway turns onto runways, aprons, or other taxiways, there are FAA design standards for the geometry of the fillets, based on the angle of the turn. Currently, the taxiways at ALB do not meet the fillet dimensions as they were constructed prior to the current standards. It is recommended that the fillet changes are considered at each intersection when the pavement is in need of rehabilitation or reconstruction, in consultation with the FAA. For new taxiways, all current design standards would be applicable.

<u>Taxiway Lights</u> – All taxiways at ALB are equipped with Medium Intensity Taxiway Lights. Taxiways that cross runways are also equipped with Runway Guard Lights. These systems are adequate throughout the planning period.

<u>Taxiway Designations</u> – The FAA provides guidance for the naming (i.e. designations) of taxiways with the intent of improved pilot and controller awareness and spatial orientation. The existing taxiway designations were reviewed, and improvements have been identified. Specifically, the FAA prefers that the exit taxiways (i.e., stub taxiways) along a runway follow an alphanumeric naming pattern associated with the parallel taxiway. For example, at ALB there are seven exit taxiways between Runway 1/19 and parallel Taxiway ‘A’. These exits are currently designated as ‘M’, ‘B’, ‘D’, etc. Per FAA, these exits should be designated as ‘A1’, ‘A2’, ‘A3’, etc. Updated taxiway designation recommendations are provided in the Alternatives evaluation.

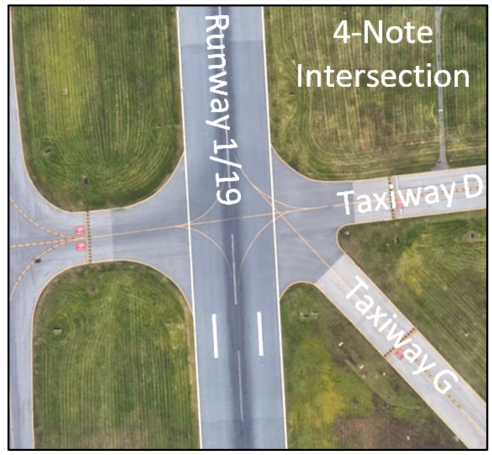
Taxiway Recommendations:

- ✈ Retain the existing 75’ taxiway width for all parallel and exit taxiways, through periodic rehabilitation. Connector Taxiways ‘D’, ‘G’, ‘P’, etc. should follow the standard needed for the specific aircraft users utilizing these airfield areas.
- ✈ Provide a full parallel taxiway on east side of Runway 1/19
- ✈ Upgrade the taxiway intersection fillets if and when taxiways required reconstruction
- ✈ Update the Airport’s taxiway designation to adhere to FAA guidelines

4.2.7 Airfield Geometry

Taxiway Intersections –FAA standards recommends taxiway intersections be at a 90 degree angle, as acute angle taxiway crossings can create blind spots while holding short. Currently, Taxiways 'G', 'J', 'K', 'M' (northwest quadrant only), and 'Q' do not meet this geometry standard. It is recommended that the non-standard geometry be considered for improvements when pavement rehabilitation for the aforementioned taxiways is required. Cost and environmental impacts would be considered for each location.

Figure 4-9 – Non-Standard Intersections



As a result of the 90-degree intersection angle, the FAA recommends intersection points to have no more than three nodes (i.e., an aircraft taxiing can continue straight, turn 90 degrees left, or turn 90 degrees right). More than three turn options can lead to spatial disorientation. There is currently one location at ALB that exceeds the 3-node intersection geometry consisting of Runway 1-19, Taxiway D, and Taxiway G. This results in a 4-node intersection and acute angles. It is recommended that this area be realigned to meet the FAA standard.

Direct Apron-to-Runway Access – Direct apron-to-runway access refers to a nonstandard airfield geometry allowing an aircraft to taxi from a point on an apron, directly onto the runway, without making any turns. Such a layout can cause unsafe operating scenarios in which a pilot mistakes the runway for a taxiway. Presently, the taxiway connections from the terminal apron each provide a nonstandard direct apron-to-runway access. Additionally, the air cargo, FBO, and other aprons also have this nonstandard layout. It is recommended that these nonstandard geometries be mitigated with the use of painted green islands or configuration changes.

Figure 4-10 – Direct Apron-to-Runway Access

Limit Runway Crossings – Minimize runway crossings to the extent possible and reduce crossings within the center third of the runway (i.e., the high-energy area). At ALB, there are three taxiway crossings in the middle third of the runways and others in proximity (<1,000 feet) of the next crossing. During the Development Alternatives, potential taxiways that could be modified or ultimately eliminated will be identified for consideration. A few examples of this condition include:

- Taxiway 'G' - which connects to Runway 1/19 in the center third of the runway

- ✈ Taxiway 'K' - is located in proximity (<1,000 feet) to adjacent taxiways to the east and west (Taxiway 'K' also provides direct apron-to-runway access, and is at a 70 degree angle).

Separate Parallel Taxiways from Non-Movement Areas – The west end of Taxiway C is co-located with the Terminal Apron, where aircraft are pushed-back from the gates. As such, this location of Taxiway 'C' is a Non-Movement area, not under the positive control of the Air Traffic Control Tower (ATCT). This is the only location at ALB with this condition. If feasible, a separation between Taxiway 'C' and the apron would mitigate this condition and gain positive ATCT control of this area.

Exit Taxiway Locations – In order to enable aircraft to exit the runway quickly and efficiently upon landing, exit taxiway should be appropriately located to capture the highest percentage of users during both wet and dry conditions. This can be difficult at airports like ALB that accommodate a wide variety of commercial and general aviation aircraft types with different landing performance and rollout distances. However, as ALB current provides numerous exit taxiway locations on both runways (approximately every 1,000') there are currently abundant exit options under all conditions. No additional exit or connector taxiways are needed.

Airfield Hot Spots – A Hot Spot is a location within the airfield with a history or potential risk of collision or runway incursion due to factors such as airport layout, traffic flow, airport marking, signage and lighting, which reduce situational awareness. They typically center around runway/taxiway or taxiway/taxiway intersections. Hot Spots are depicted on Airport Diagrams and designated as "HS 1", "HS 2", etc., along with textual descriptions outlining the reason for the Hot Spot. ALB currently does not have any Hot Spots.

Figure 4-11 – Non-Standard Runway to Taxiway Separation

4.2.9 Airfield Facility Requirement Summary

Overall, the existing airfield satisfies most of the identified requirements throughout the planning period. Furthermore, it is noted that the identified airfield shortcomings are not directly related to activity levels or forecast growth. Rather they are mainly related to changes in FAA runway and taxiway design standards that have occurred in the last 10-years. The airfield facility requirements are summarized below:

- The ROFA contains portions of the airport service road. If feasible, the service road should be relocated in these locations.
- Small portions of the RPZs are not owned by the Airport. Acquisition or easements should be considered for these locations that remain in private ownership to provide airport control over future development.
- A portion of Taxiway ‘C’ has less than the minimum 400’ runway-taxiway offset. This location is also in a Non-Movement Area of the taxiway.
- Crosswind Runway 10/28 provides additional airport wind coverage needed to support all aircraft types and users. It should be maintained as ARC D-III to support airline jets due to strong westerly winds.
- The Runway 1 MALSR system should be replaced-in-kind, as it is capable of support Category II minimums.
- The Critical Aircraft is forecasted to remain ARC D-IV; however, if regular air cargo operations change from a Boeing 757 to an Airbus A300, the TDG would increase from 4 to 5, which increase the minimum taxiway width to 75 feet for appropriate taxiways.
- Add a full parallel taxiway to the east side of Runway 1/19 to avoid runway crossings, improve safety, and promote better land use utilization on the Airport, as development is pursued on that side of the airport
- Recent FAA taxiway geometry changes has impacts on the following existing conditions at ALB:
    - Taxiway Fillets: Upgrade to the new FAA standard geometry during runway rehabilitation projects.
    - Modify taxiway intersections to 90 degrees, where practical.
    - Eliminate 4-node intersection of Runway 1/19, at Taxiways ‘D’ and ‘G’.
    - Reduce or eliminate direct apron-to-runway access, which currently exist at most exit taxiways.
    - Consider reducing the number of available runway crossings, particularly in the middle third of the runways.

4.3 Terminal Facility Requirements

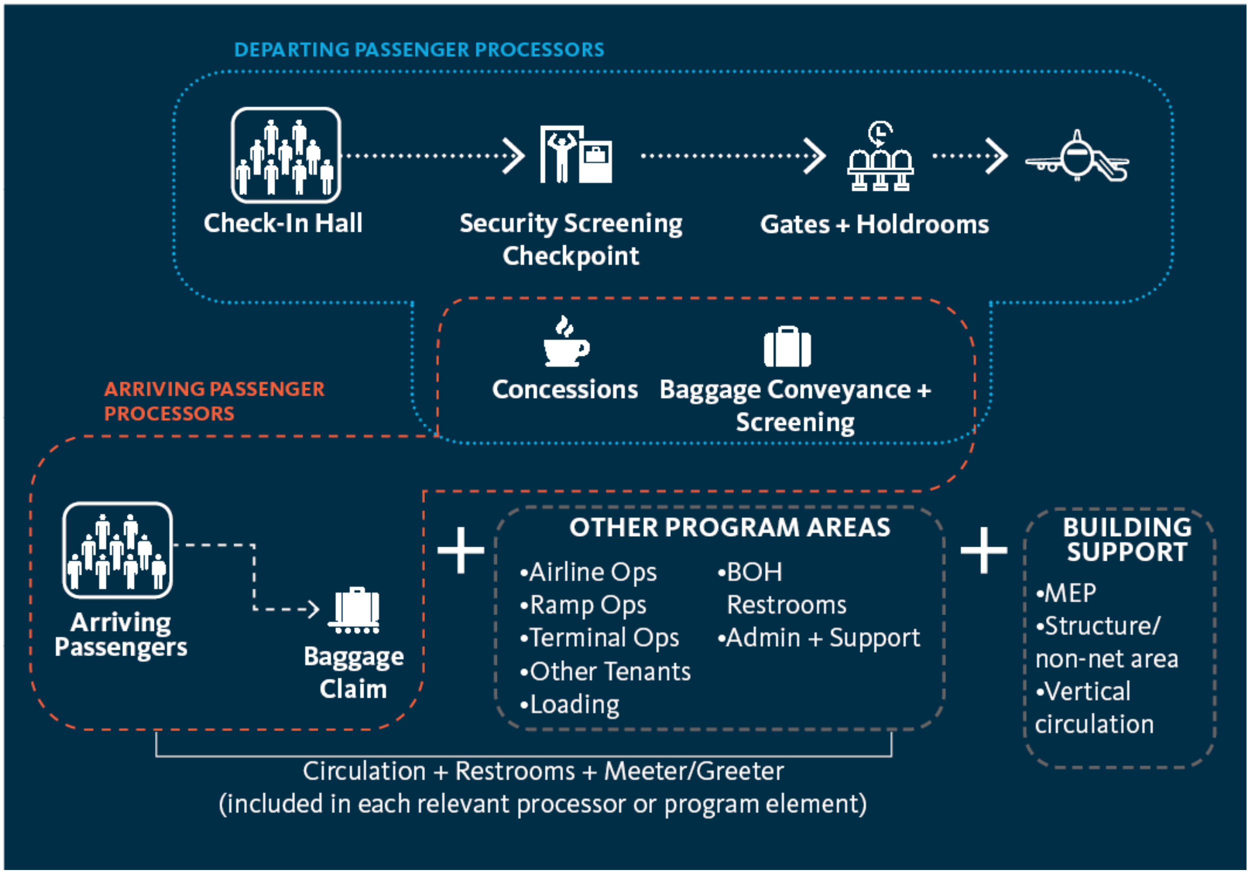
4.3.1 Terminal Programming

The approach to terminal programming uses a combination of Annual Volume, Peak Hour Passenger numbers and number of Gates to provide an estimate of required terminal program areas.

For the terminal program, space needs have been separated for analysis by processor and function:

- Departing Passenger Processors
  - Check-In Hall
  - Security Screening Checkpoint
  - Gates and Holdrooms
- Arriving Passenger Processors
  - Baggage Claim
- Shared Processors
  - Concessions
  - Baggage Conveyance + Screening
- Other Program Areas
  - Airline Ops
  - Ramp Ops
  - Terminal Ops
  - Other Tenants
  - Loading
  - BOH Restrooms
  - Administration and Support Spaces
- Building Support Spaces
  - Mechanical/Electrical/Plumbing Areas
  - Structure/Non-Net Areas
  - Vertical Circulation

This approach is graphically shown in the following illustration:



Summary sections have been provided for each process and function type. These outline Key Planning Assumptions used (for instance, processing speeds and preferences) and quantities and summaries by space type.

Overall circulation spaces (for example, Concourse circulation) have been assigned to each processor. This allows for an easier translation of program areas to physical planning by space and provides an opportunity to optimize circulation space as appropriate by zone.

Programming has been completed for each of the processors individually using the reference data as a base. However, understanding that any future modifications to this facility will require renovation and potentially expansion, the program areas should not be evaluated as absolute and are subject to consideration in context with existing conditions. A summary chart at the end of the document lists the aggregated space programming recommendations for the terminal compared against the current inventory of terminal areas.

4.3.2 Planning Assumptions

For physical planning purposes, two planning horizons, or Planning Activity Levels (PALs) have been assessed at this time for terminal space programming. The PALS generally refer to a future activity level, based on a forecast year (i.e. PAL 1 = 2026; PAL 2 = 2031; PAL 3 = 2036; PAL 4 = 2041). However, the term is intended to acknowledge that facility requirements are based on a future activity level, which may occur before or after the forecast year. For the terminal requirements, the evaluation references PAL 2 and PAL 4, or the mid and long-term planning horizons. For reference, the program also includes an "Existing" category indicating current program areas augmented due to the known upcoming expansion planned as part of the Pre-TSA Expansion Improvement project.

The Projected Activity Level assumptions used as the basis of the terminal facilities program are outlined in **Table 4-12** – Projected Activity Levels. These include Baseline activity (which utilizes 2019 data, representative of pre-Pandemic levels of activity), PAL 2, and PAL 4 information. Annual Volume and Peak Hour Passenger (PHP) information have been referenced as the primary drivers of terminal program.

It is assumed that all passenger traffic will be for domestic operations throughout the planning period.

Table 4-12 – Projected Activity Levels

		Baseline (2019)	PAL 2	PAL 4
ANNUAL VOLUME	Domestic Passengers (Enplaned)	1,492,305	1,841,000	2,107,000
	International Passengers (Enplaned)	0	0	0
	Connections / In-Transit Passengers	0	0	0
	TOTAL (Enplaned + Connections)	1,492,305	1,841,000	2,107,000
PASSENGER PROFILES	Domestic Passengers	100%	100%	100%
	International Passengers	0	0	0
PEAK HOUR PASSENGERS	Departing Passengers	905	1,130	1,300
	Arriving Passengers	737	925	1,057
GROWTH	Departing Passengers	-	24.86% increase over baseline	43.65% increase over baseline

Source: Gensler, 2023

The existing terminal provides 14 concourse level gates with passenger boarding bridges, plus several ground/apron level gates that previously served turboprop aircraft. The future required number of Aircraft Gates were provided as a Planning Assumption based on future flight schedules and forecasts generated for PAL 2 and PAL 4 in **Section 3.5.2**. This review indicated that future passenger growth can be accommodated through optimization of the existing 14 gate layout on the concourse level, paired with the ongoing 2-gate improvement project that will replace two existing ground-level gates in Concourse A with two Group III gates with passenger boarding bridges directly from the Concourse level. With improved utilization of the existing gates and the ongoing project, the total of 16 concourse level gates is anticipated to satisfy requirements through PAL 4.

Table 4-13 – Aircraft Gates

			Baseline (2019)	PAL 2	PAL 4
GATES	Domestic Gates	Group III (or smaller)	**14**	**16**	**16**
	TOTAL		**14**	**16**	**16**
	Hardstand Positions		**0**	**0**	**0**

Source: Gensler, 2023

In discussions with the Airport, physical planning should identify potential locations for four additional aircraft positions, or 20 total Gates, if airline requirements or passenger demands result in a higher than forecasted need. For the purposes of this program, additional resultant areas have not been included in overall program totals.

Throughout the document, where Level of Service is referenced, the target has been set at the International Air Transportation Association's (IATA) midpoint Optimum Level of Service (LOS), IATA, 10th Ed, and where peak 30-minute loading is used, and a 60% peaking factor has been assumed.

Assumptions about Common Use, Preferential Use, and/or Proprietary Use models have been specifically included where applicable; these assumptions vary by processor. In certain key areas, benchmarking against current facility program has been provided.

4.3.3 Check-In Hall

The analysis for the Check-In processors assumes a mix of Full-Service agent positions (where passengers complete their entire transaction with an agent), Bag Drops (where passengers drop bags after checking-in on-line or at a kiosk), Self Service Kiosks, and an estimate for the number of passengers who complete check-in remote (i.e. at curb, home, via mobile device, etc.).

Full-Service positions are computed in accordance with IATA Airport Development Reference Manual (ADRM) equations, utilizing an assumed Peak 30-Minute factor of 60%.

Bag Drop positions are assumed to be spatially comparable to the Full-Service counters. Future deployment of self-drop induction points may result in space savings. However, equivalent dimensions between Full-Service and Bag Drops were maintained throughout the planning period in order to protect short term flexibility without compromising future reconfiguration potential.

Bag Drop Kiosk demand is determined by assuming all passengers utilizing Bag Drops are using Kiosks in a two-step transaction (where passengers check-in and print bag tags at the kiosk before moving to the actual induction point).

Self Service Kiosks are provided for those passengers requiring e-ticket services but who are not checking bags. Key assumptions for percentage of passenger split and processing times are listed below.

The Departures Public Concourse is located between the terminal entries and the start of the ticketing queues, the size of this area is determined by taking the linear frontage of the terminal processor and multiplying it by a nominal 35-foot depth of circulation.

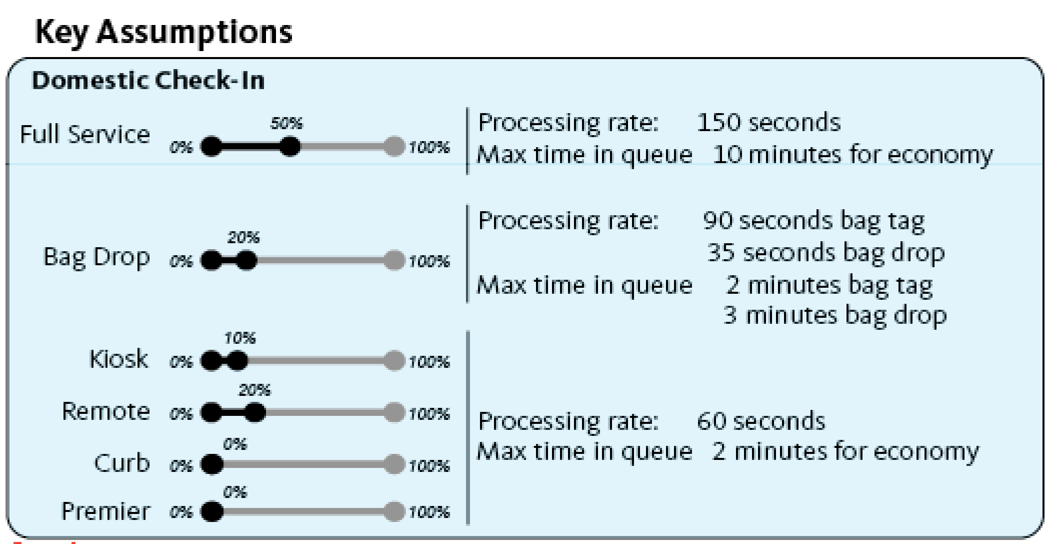
The Departures Meeter/Greeter Area is calculated by assessing occupancy, assuming that every tenth passenger will have one Meeter/Greeter, spending 20 minutes within the terminal. The peak hour occupancy is multiplied by 23 SF per IATA LOS standards.

The Airline Ticket Support Offices (ATO) area assumes that these offices run continuously behind the row of Full-Service Counters and Bag Drop positions, at a 30ft depth.

Check-In Hall Customer Service area uses an industry standard square foot per passenger ratio of 1 SF per 10 peak hour departing passengers.

Operations and Support spaces adjacent to the Departures Hall use a planning guideline of 2.5% of overall terminal operations space.

Key processing assumptions for the Common Use positions are shown below. In the future, it is anticipated that adoption of mobile and semi-independent ticketing modes (such as Bag Drop, Kiosk, and Remote Check-In) will increase. However, to allow flexibility for infrequent travellers, Common Use assumptions retain a higher portion of Full-Service Counter positions as a baseline.



Two analyses for Ticket Counter positions have been conducted. The first analysis (see **Table 4-14**) indicates the number of counters that would be required if all positions are programmed as Common Use.

The second analysis (see **Table 4-15** and **Table 4-16**) indicates what would be required with a combination of leased and Common Use Ticket Counters. Currently, the Airport has a combination of leased ticketing counters and unbranded/Common Use positions. Future analysis assumes that the four long-term tenant airlines with the highest activity levels at ALB (American Airlines, Delta Air Lines, United Airlines and Southwest Airlines) will retain leased positions and that the number of their positions will grow at pace with overall departing passenger growth. Common Use positions will comprise the remaining Ticket Counters. Future forecasts indicate that 100% of the peak hour passenger activity will be represented by the four aforementioned carriers, but that overall, these carriers will represent 92% of overall daily departing passenger traffic. Therefore, additional Common Use counter requirements have been calculated to capture 8% of the overall daily departing passenger traffic. For the purposes of the overall area summary in **Table 4-14**, the second analysis has been used.

Table 4-14 – Check-In Requirements – All Common Use

		Existing		PAL 2		PAL 4	
		Count	Area (sf)	Count	Area (sf)	Count	Area (sf)
Check-in Positions, Circulation, and Queuing Areas	Full-Service Counters (One counter = 2 positions | One scale provided per counter)	30	6,010	25	8,200	28	9,184
	Bag Drop Induct	-		4	1,312	5	1,640
	Bag Tag Kiosks	-		8	513	10	590
	Self Service Kiosks	-		4	268	4	291
Airline Ticketing Offices	ATO (Assumes 30lf depth behind Full-Service and induct positions)	-	10,849		6,960		7,920
Departures Restrooms	Restroom Module	-	897	1	1,631	1	1,631
Circulation	Public Concourse (Assumes 30lf depth in front of Check-In and Security)	-	11,907		10,290		11,805
Meeter/Greeter		-	-	-	879		1,018
Customer Service		-	-	-	200		200
Operations and Support		-	-	-	600		600
TOTAL		29,663		31,483		34,879	

Source: Gensler, 2023

Table 4-15 – Ticket Counter Requirements – Combination of Leased and Common Use

Airline / Service Provider	Existing In-Line Positions / Equivalent Standard Counter Count	PAL 2 Equivalent Standard Counter Count	PAL 4 Equivalent Standard Counter Count
American	10 / 5.5	8	8
Delta	6 / 3	4	6
United	6 / 3	4	6
Southwest	7 / 6	8	10
JetBlue	6/3	14	15
Allegiant	6/3		
Frontier	6/3		
Unbranded	6/3		
TOTAL	**53/29.5**	**38**	**45**

Source: Gensler, 2023

Notes:

- Future Ticket Counter positions for the four airlines indicated in orange rows have been extrapolated using increases in peak hour passenger data for those activity periods. Existing in-line counts are based on actual positions, which may use different dimensions than a standard paired counter dimension. For planning purposes, equivalent standard counter count numbers have also been included. For future planning purposes, the equivalent standard counter count number has been increased and rounded up to the nearest full even number. This is an estimate only and will be subject to actual space programming requirements from the airlines.
- Other positions have been aggregated into a Common Use model, assuming 8% of overall daily passenger volume will use these positions at non-peak times.
- Current Equivalent Standard Counter Count has been shown as 29.5 because current American Airlines ticketing counter positions utilize half an equivalent counter, while there is space for 30 full counters.

Table 4-16 – Check-In Requirements– Combination of Leased and Common Use

		EXISTING		PAL 2		PAL 4	
		Count	Area (sf)	Count	Area (sf)	Count	Area (sf)
Check-in Positions, Circulation, and Queuing Areas	Full Service Counters (One counter = 2 positions | One scale provided per counter)	**30**	**6,010**	38	12,464	45	14,760
	Bag Drop Induct	-		INC ABOVE		INC ABOVE	
	Bag Tag Kiosks	-		8	513	10	590
	Self Service Kiosks	-		4	268	4	291
Airline Ticketing Offices	ATO (Assumes 30lf depth behind Full Service and induct positions)	-	**10,849**	-	9,120	-	10,800
Departures Restrooms	Restroom Module	-	**897**	1	1,631	1	1,631
Circulation	Public Concourse (Assumes 30lf depth in front of Check-In and Security)	-	**11,907**	-	13,410	-	14,130
Meeter/Greeter		-	-	-	879	-	1,018
Customer Service		-	-	-	200	-	200
Operations and Support		-	-	-	600	-	600
TOTAL		**29,663**		**39,085**		**44,020**	

Source: Gensler, 2023
Note: The split Leased/Common Use counter position analysis applies to inline positions only. Projected bag tag Kiosks and Self Service Kiosks (which are frequently located in the queue areas, or elsewhere in the ticketing hall) have used the Common Use analysis calculations.

4.3.4 Security Screening Checkpoint

Security screening requirements use IATA ADRM equations for developing passenger demand and TSA Automated Screening Lanes (ASL) estimates for spatial requirements. As ASL lanes typically require more area than traditional lanes, their incorporation in the program will safeguard for their future adoption. The number of screening lanes are established by taking the Peak 30-Minute throughput (assumed to be 60% of peak hour demand) created by the Full-Service Check-In counters, Bag Drops, Self Service Kiosks, and passengers bypassing Check-In altogether and proceeding directly to the checkpoint.

Standard Lanes and PreCheck Lanes and their respective queues are computed separately using their individually assumed processing rates and queuing times.

Key assumptions for processing speeds and Standard Lane/PreCheck adoption split are outlined in the Key Assumptions below. If these processing speeds remain unchanged for the entire duration of planning, applying to both PAL 2 and PAL 4 programs, an additional security lane would be needed (i.e., seven total). However, it is anticipated that changes in processes and efficiencies in processing will occur over the next 20 years, and thus likely retaining the PAL 2 demand for six security lanes.

Key Assumptions

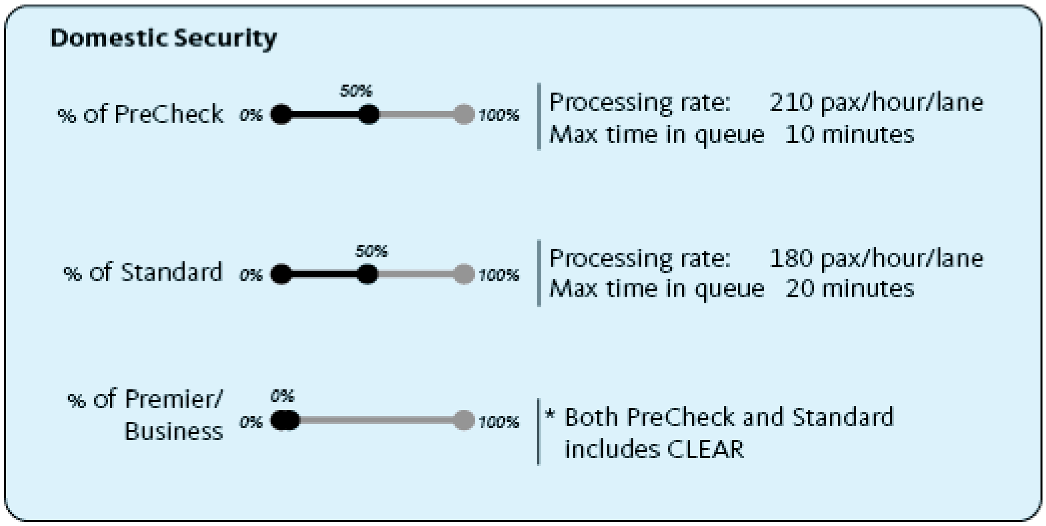


Table 4-17 – Security Screening Checkpoint Requirements

		EXISTING		PAL 2		PAL 4	
		Count	Area (sf)	Count	Area (sf)	Count	Area (sf)
Security Lanes	PreCheck Lanes	3	4,103	3	10,323	4	12,044
	Standard Lanes	3		3		3	
	Total	6		6		7	
Circulation	Boarding Pass Check	-	1,331	4	1,279	5	1,510
	Security Checkpoint Queue	-		-	3,330	-	3,885
	Recompose (Assumes 20lf recompose zone)	-	Inc. Above	-	2,220	-	2,590
Security Operations and Support	Includes KCM, TSA Checkpoint space, PSRs, etc	-	6,891	-	1,795	-	1,795
Remote Security Agency Support		-	-	-	315	-	368
TOTAL	12,546			19,262		22,192	

Source: Gensler, 2023

Notes:

- Dedicated employee screening lane has not been included in calculations at this time.
- It is assumed that increased processing speed and efficiency could potentially reduce the number of Security Lanes in future horizons.

4.3.5 Gates and Holdrooms

As outlined in Section 4.4.2, the number of Gates have been determined by future flight schedules. For this analysis, it is assumed that each gate will have one corresponding Holdroom.

The amount of Holdroom area required is determined by the seats per aircraft to be accommodated, applying a load factor (i.e. what percentage of the aircraft will be occupied) and then evaluating how many passengers would be in the Holdroom prior to the flight. Of the passengers in the Holdroom, a breakdown of seated versus standing passenger is completed to determine area per passenger. Specific assumptions are shown in the Key Assumption chart, below. In addition, an allowance is made at each gate for Operations Spaces (e.g. podium area for agents, enplaning corridor dimension, area for wheelchair staging), located at the Gate.

If provided in the future, Airline Lounge occupancy is assumed to be 3% of peak hour departures. The occupancy load is then multiplied by an estimated standard area per passenger to calculate the total lounge needs.

Concourse Customer Service uses an industry standard SF per passenger ratio of 1 SF per four peak hour departing passengers.

Departures Concourse Operations and Support areas along the Departures Concourse are determined by using a benchmark metric of 3%.

Concourse Circulation is determined by first establishing a typical linear footage for each contact gate position, which is calculated by adding the wingspan to a standard clearance dimension and multiplying it by the total number of aircraft. This overall linear dimension is then multiplied by a Concourse width of 40’. The program assumes that 65% of the flightline is double loaded (i.e., holdrooms and gates on both side of the Concourse).

Key Assumptions

- Seat Counts
  Group III: 190 seats
- 90% Load factor
- 80% Pax at gate
- 70% Seated / 30% Standing at gate
- Assume 50% of gates are paired. Paired gates have 10% space reduction for seating area only
- The October 2021 Forecast Update Draft assessed likely replacement aircraft that will be utilized in the future. The largest replacement aircraft identified is an A320/321 with a seat count of between 150 and 190 seats. For interoperability of gates, 190 seats is used as the basis of determining future gate areas.

PAX Per Aircraft

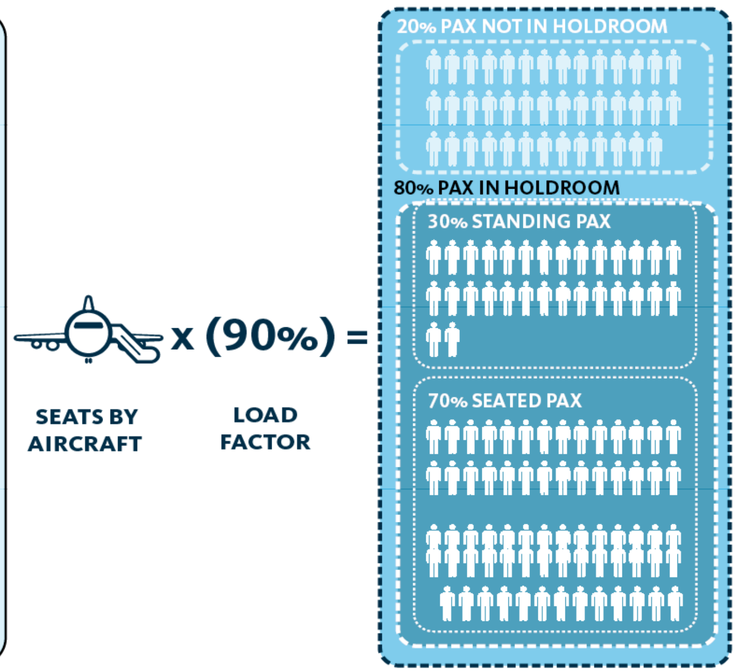


Table 4-18 – Gate and Holdroom Requirements

	EXISTING		PAL 2		PAL 4	
	Count	Total (sf)	Count	Total (sf)	Count	Total (sf)
Holdrooms Group III Domestic	14	40,376	16	41,970	16	41,970
Circulation	-	49,041	-	68,160	-	68,160
Airline Lounges	-	0	-	1,696	-	1,950
Concourse Customer Service	-	0	-	300	-	400
Departures Level Ops + Support	-	-	-	700	-	800
Restrooms	-	6,868	-	4,015	-	4,958
TOTAL	96,285		116,841		118,238	

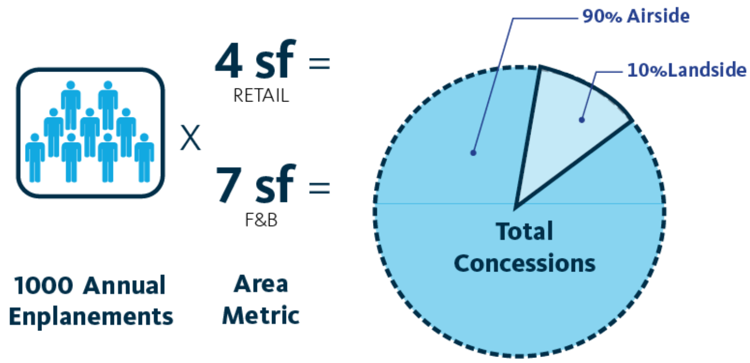
Source: Gensler, 2023

4.3.6 Concessions Requirements

Concessions space allocation is determined as a function of Annual Enplanement numbers. Overall area is divided between airside and landside. The Retail and Food & Beverage numbers indicate net concessions unit areas. Support space is also shown (for remote storage) and a service circulation factor is also shown (for back-of-house servicing and circulation).

Key Assumptions

- For retail rentable: approximately 4 sf/1000 annual domestic enplanements
- For food and beverage (F&B) rentable: approximately 7 sf/1000 annual domestic enplanements
- Concessions support is 30% of rentable area
- Service circulation factor of 30% of rentable area



Based on these Key Assumptions, concessions requirements are as follows:

Table 4-19 – Concessions Requirements

		EXISTING		PAL 2		PAL 4	
		Count	Area (sf)	Count	Area (sf)	Count	Area (sf)
Landside Concessions	Retail	-	2,464	-	737	-	843
	F&B	-		-	1,289	-	1,475
	Support	-		-	608	-	696
	Service Circulation	-		-	608	-	696
Airside Concessions	Retail	-	23,435	-	6,628	-	7,586
	F&B	-		-	11,599	-	13,275
	Support	-		-	5,470	-	6,259
	Service Circulation	-		-	5,469	-	6,259
TOTAL		**25,899**		**32,408**		**37,089**	

Source: Gensler, 2023

4.3.7 Baggage Conveyance + Screening

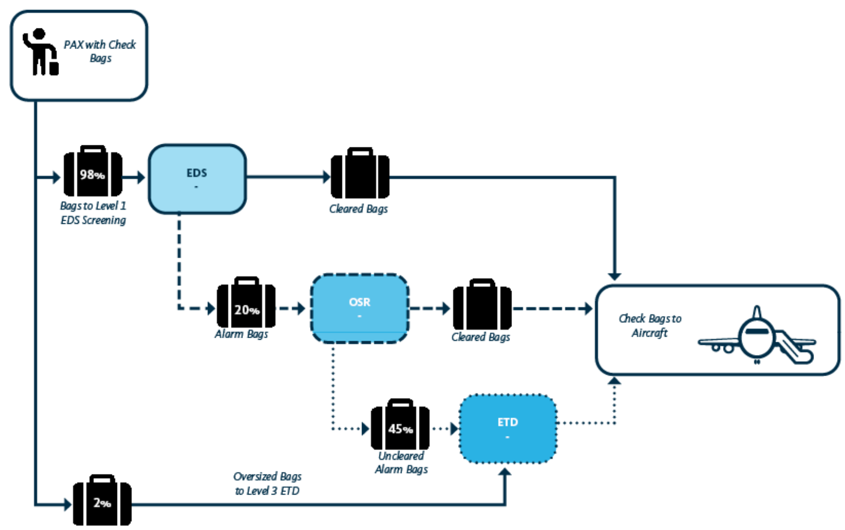
The baggage system is made up of the following constituent elements: outbound screening, baggage makeup, and inbound baggage. The system demand and individual areas are programmed using standard processing rates and benchmarked areas.

Baggage Screening – The number of Peak Hour bags (reduced by the oversize ratio) is divided by an Explosive Detection System (EDS) processing rate to determine the number of devices required for Level 1 screening. The bags for Level 2 and 3 screening are divided by their respective screening rates to establish the number of units required. Assumptions about screening rates are shown in the Key Assumptions chart.

<u>Baggage Make-Up</u> – Baggage Make-Up assumes that each device will service three gates, with an allowance for tug circulation space adjacent to each Make-Up unit.

<u>Inbound Baggage</u> – Inbound Baggage is based upon the estimated number of claim devices. This analysis has been completed assuming future continued utilization of a flat plate, through-wall baggage system.

OUTBOUND



Key Assumptions

OUTBOUND

- Domestic Bag Ratio .75 bags / pax
- International Bag Ratio 2 bags / pax
- 2% oversized bags
- 20% of bags send to Level 2 OSR
- 45% OSR sent to Level 3
- 100% of International transferring bags screened

INBOUND

- 1 Inbound Belt per Narrowbody Claim Device

Table 4-20 – Baggage Conveyance + Screening Requirements

		EXISTING				PAL 2				PAL 4			
		Count (units)	Unit Area (sf/ units)	Extended Area	Total (sf)	Count (units)	Unit Area (sf/ units)	Extended Area	Total (sf)	Count (units)	Unit Area (sf/ units)	Extended Area	Total (sf)
OUTBOUND	Level 1 EDS	-	-	-	23,435	3	1,000	3,000	46,077	4	1,000	4,000	48,677
	Level 2 OSR	-	-	-		2	50	100		3	50	150	
	Level 3 ETD	-	-	-		1	125	125		3	125	375	
	Conveyors and Sorting Matrices	-	-	-		-	-	3,225		-	-	4,525	
	Early Bag Storage	-	-	-		0	0	0		0	0	0	
	Makeup Devices	-	-	-		6	-	11,250		6	-	11,250	
	Outbound Tug Circulation + Operations	-	-	-		-	-	28,377		-	-	28,377	
SHARED	Restrooms + Support	-	-	-	-	-	-	-	1,430	-	-	-	1,430
INBOUND	Stripping Belts	-	-	-	7,051	3	-	585	7,272	4	-	780	9,696
	Outbound Tug Circulation + Operations	-	-	-		-	-	6,687		-	-	8,916	
TOTAL		22,383				54,779				59,803			

Notes:

- Inbound and outbound device identification shown is estimated for the purposes of overall preliminary programming and should be validated by a dynamic analysis.
- Areas shown do not include additional storage or maintenance needed for Mobile Inspection Tables (MITs) if selected for use at this facility.
- This analysis represents a shared approach to Makeup Devices and Stripping Belts, not dedicated use.
- Inbound and outbound oversized lines will also be required/provided, in addition to elevator for non-conveyables. These have not been included in this analysis.
- As of November 2023, improvements to the Baggage Makeup and Screening System are being advanced, with construction activities planned for as early as 2024. The improvements will include an in-line baggage system. The system layout and requirements are being refined and incorporated into the design process.

4.3.8 Baggage Claim

Domestic claim devices are sized by first determining the claim length required to accommodate the expected occupancy of the claim hall. The Peak Hour Domestic Arriving Passenger count is adjusted by the percentage of passengers claiming bags and how many of them are at claim at one time. This number is multiplied by the assumed frontage per passenger with the final length considering passengers will form one and a half rows around the device (each four linear feet of claim will serve three passengers). This length required is divided by the minimum presentation length to determine the number of devices. Positive claim assumes 15 feet of queue around the device and area for passenger circulation.

Baggage Hall Customer Service uses an industry standard SF per passenger ratio of 1 SF per 10 peak hour arriving passengers.

Baggage Services Offices are assumed to be sized at approximately 10% of the total Bag Claim Hall.

Baggage Claim Hall Operations and Support spaces adjacent to the Bag Claim Hall are typically 2.5% of overall terminal operations space.

The Arrivals Concourse size (located between the terminal exits and the bag claim devices) is determined by taking the linear footage of the bag claim hall (devices assumed to be perpendicular to the terminal face) and multiplying it by a nominal 35-foot depth of circulation.

The Arrivals Meeter/Greeter Area is calculated by first determining its occupancy. It is assumed that every tenth passenger will have one Meeter/Greeter, spending 20 minutes within the terminal. This occupancy is then multiplied by IATA LOS standards to determine overall area.

Key Assumptions

- 75% of pax claiming bags
- 60% of pax at claim at one time
- Average claim frontage per pax: 2 feet/pax
- Rows of pax at claim: 1.5
- Presentation length for Group IIIs is 180 lf
- Additional positive claim length per device: 15 lf
- Width of circulation: 10 lf

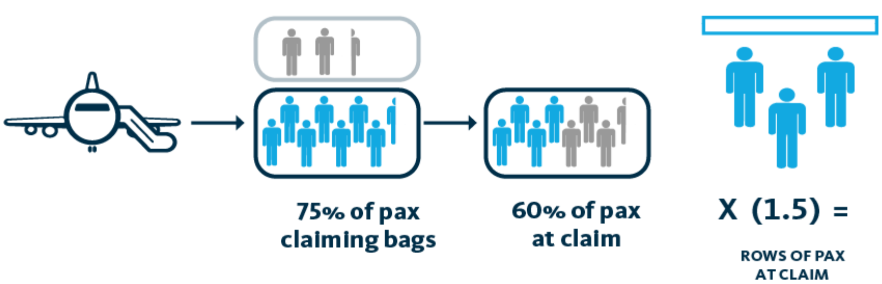


Table 4-21 – Baggage Claim Requirements

		EXISTING			PAL 2			PAL 4		
		Count (units)	Extended Area (sf)	Total (sf)	Count (units)	Extended Area (sf)	Total (sf)	Count (units)	Extended Area (sf)	Total (sf)
DOMESTIC CLAIM DEVICES	Claim Device	**3**	-	**10,597**	**3**	**4,200**	**17,700**	**4**	**5,600**	**23,600**
	Positive Claim Area	-	-		-	**13,500**		-	**18,000**	
DOMESTIC CLAIM HALL SUPPORT	Customer Service	-	-	**1,093**	-	**100**	**100**	-	**200**	**200**
	Baggage Services Offices	-	-		-	**4,750**	**4,750**	-	**4,750**	**4,750**
	Restrooms	-	-		-	**1,631**	**1,631**	-	**1,631**	**1,631**
	Baggage Claim Hall Ops + Support	-	-		-	**600**	**600**	-	**600**	**600**
CIRCULATION	Arrivals Concourse	-	-	**8,644**	-	**5,400**	**5,400**	-	**7,200**	**7,200**
	Meeter + Greeter	-	-		-	**1,088**	**1,088**	-	**1,250**	**1,250**
TOTAL		**17,700**			**31,269**			**39,321**		

Source: Gensler, 2023

4.3.9 Other Program Areas

Based upon benchmarks and typical planning standards, the following assumptions have been used to identify required operations and support areas. These areas are included in the total net building area calculations.

- Operations and Support: 1,000 SF per 100 peak hour passengers
- Back of House Operations and Support:
  - 92% of Total Operations (remainder allocated in public spaces itemized above) allocated as follows:
  - Airlines: 35%
  - Ramp: 20%
  - Terminal: 22%
  - Storage: 10%
  - Tenants/Business Partners: 5%
- Loading Dock: 2 docks for first six Gates with an additional dock for every six additional Gates (rounded up)

Table 4-22 – Other Program Requirements

		EXISTING		PAL 2		PAL 4	
		Count	Area (sf)	Count	Area (sf)	Count	Area (sf)
TERMINAL OPERATIONS	Airline Operations	-	8,393	-	7,200	-	8,300
	Ramp Operations	-	7,559	-	4,200	-	4,800
	Terminal Operations	-	29,530	-	4,600	-	5,200
	Terminal Storage	-	Inc. Above	-	2,100	-	2,400
	Other Tenants/ Business Partners	-	2,463	-	1,100	-	1,200
	Loading Docks	-	Inc. Above	3	2,160	3	2,160
BACK OF HOUSE RESTROOMS		-	Inc. Above	-	1,016	-	1,016
TOTAL		47,945		22,376		25,076	

Source: Gensler, 2023

In addition, the following areas have been included to account for building operational spaces and envelope. These areas are calculated as a percentage of the total net building areas and have been included in the overall Program Area Summary **Table 4-23**.

- Mechanical, Electrical, Plumbing & IT Systems: 12% of total net terminal area
- Structure: 2% of total net terminal area
- Vertical Circulation: 8% of total net terminal area

An allowance for design variations has not been included in this program at this time. However, it is recommended that an allowance for design variation be included to capture irregular building geometry and inherent inefficiencies when expanding or modifying existing structures.

Regarding the existing terminal apron, a review was conducted of the existing fourteen (14) at-gate aircraft parking positions, and four non-gate Remain Overnight (RON) parking positions. Each position was review for spacing of lead-in lines and wingtip clearances for ADG III. The review identified that separation and the minimum 20' wingtip clearance is adequate for the ADG III design aircraft. However, certain gate locations with converging lead-in lines must be operated dependently. Thus, aircraft parking (i.e., power-in and push-back) are controlled by the individual airlines. The Airport has a planned apron pavement rehabilitation project commencing in 2025. It is recommended that this project review existing aircraft parking position markings to optimize flexibility and safety.

4.3.10 Programmatic Summary

A summary chart has been generated to capture program information for each of the individual processors and building support areas.

Table 4-23 – Program Area Summary

		Existing Inventory	PAL 2	PAL 4	Recommendations
		Area (sf)	Area (sf)	Area (sf)	
TOTAL PROGRAM	Departures Check-In Hall	**29,663**	**39,085**	**44,020**	There will be a likely need to expand the current ticketing hall to accommodate additional positions.
	Departures Passenger Processing	**12,546**	**19,262**	**22,192**	See note below regarding additional area to be added to the Existing Inventory as part of the ongoing Pre-TSA Expansion project.
	Departures Concourse	**96,285**	**116,842**	**118,238**	Modifications to the existing Gates and Concourse area should be considered to address perceptions of current gate crowding and anticipate future larger design aircraft at each gate.
	Baggage Processing	**22,383**	**54,779**	**59,803**	Areas shown in the PAL 2 and PAL 4 program are indicative of an inline outbound baggage system. PAL 4 numbers also reflect inbound operations to support an additional claim device.
	Arrivals Baggage Claim Hall	**20,334**	**31,269**	**39,231**	Existing Inventory areas at the baggage claim hall areas do not include circulation space between the devices and the rental cars, while the PAL 2 and PAL 4 numbers do. PAL 4 numbers also include addition of one claim device.
	Other Program Areas	**47,945**	**22,376**	**25,076**	Other program areas in the Existing Inventory include Airline Ops, Airport Ops and Other Ops. Future study should evaluate if these will remain in place. If so, those requirements will supersede the standard planning assumptions used to generate PAL 2 and PAL 4 numbers.
SUBTOTAL		**229,156**	**283,613**	**308,560**	
CONCESSIONS		**25,899**	**32,408**	**37,089**	This indicates opportunities for additional airside concessions.
TOTAL NET PROGRAM AREA		**255,055**	**316,021**	**345,649**	
Mechanical, Electrical, Plumbing + IT Systems		25,654	37,923	41,478	-
Structure/ Non-Net Area		N/A	6,321	6,913	-
Vertical Circulation		11,694	25,282	27,652	-
TOTAL		**292,403**	**385,547**	**421,692**	
TOTAL (after Pre-TSA Expansion project)		**315,903**			

Note: Existing inventory areas have been excerpted from Draft Working Paper #1, Table 2-6 Terminal Program Areas and do not reflect ongoing improvements, including the Pre-TSA Expansion project. As of April 2023, the current Pre-TSA Expansion areas include approximately 23,500 sf of new construction and 53,800 sf of renovated area. New construction area consists of Circulation, Concessions and Security Queuing Space. The last row of this chart indicates approximate anticipated overall facility area after completion of the current program.

4.4 Airport Parking and Terminal Curbside

This section summarizes requirements for airport parking facilities and terminal curbside, addressing needs for public parking, employee parking, roadway and curbside, and rental car facilities. Approved enplanement forecasts beginning in 2022 are used to calculate future landside facility requirements. **Table 4-24** shows the approved forecast enplanements year-over-year percentage increase.

Table 4-24 – Approved Enplanements Forecast Percentages

Year	%	Year	%	Year	%	Year	%
2022	34.8	2027	1.6	2032	1.5	2037	1.4
2023	1.7	2028	1.6	2033	1.4	2038	1.3
2024	1.7	2029	1.6	2034	1.4	2039	1.3
2025	1.7	2030	1.5	2035	1.4	2040	1.3
2026	1.7	2031	1.5	2036	1.4	2041	1.2

Source: Master Plan Forecast (2022)

4.4.1 Public Parking Requirements

There are four types of parking products offered to the public at ALB: Short Term (surface), Garage, Long Term (surface), and Economy (surface). Amongst these products, the following facilities provide capacity:

- Short Term Parking Lot – 94 spaces (plus an additional 90 spaces in the North Garage)
- Long Term Parking Lots –1,262 spaces
- North Garage – 1,912 spaces (which includes 90 spaces designated for Short Term)
- South Garage – 1,000 spaces
- Economy Lot – 2,763 spaces
- **Total All Public Parking – 7,031 spaces**

Parking data for Calendar Year 2022 was obtained from the Airport. This data included all vehicle entries and exits using cash, credit, and EZPass payment methods for the previously listed parking products, as well as temporary lots that ceased operation by the end of May 2022. In addition, the Airport allows a 30-min grace period for free parking in all lots, known as Zero Dollar transactions. These transactions only include an exit time and thus an entry time assumption was made that each vehicle was in the lot for 20 minutes. The data was analyzed to determine peak-hour parking activity for each product, as well as an aggregate of the entire system. **Table 4-25** shows the current capacity, as well as peaking information for each parking product in 2022.

Table 4-25 – Public Parking Capacity and Peaking

Parking Product	Current Capacity	Peak Utilization	Peak Time
Short Term	184	235 (128%)	4/20 12:00 PM
Long Term	1,262	1,298 (103%)	4/21 10:20 AM
North Garage	1,822	1,803 (99%)	2/24 5:40 PM
South Garage	1,000	1,116 (112%)	4/9 3:20 PM
Economy Lot	2,763	1,292 (47%)	11/24 2:40 PM
Aggregate System	**7,031**	**5,633 (80%)**	**4/21 11:20 AM**

Source: Jacobsen|Daniels (2023)

It is important to note that the Short Term, Long Term, and South Garage products are all showing over capacity. This is due to the fact that the Zero Dollar transactions do not have entry times and it is unknown the actual timeframe these vehicles remained in the parking areas. It was further determined to use the overall Aggregate System as the baseline peaking date for further analysis. April 21, 2022 was then examined for each of the parking products to determine the peak. **Table 4-26** shows the current capacity, as well as peaking information for each parking product on April 21, 2022.

Table 4-26 – Aggregate Peak Day Peaking

Parking Product	Current Capacity	Peak Utilization
Short Term	184	211 (115%)
Long Term	1,262	1,298 (103%)
North Garage	1,822	1,765 (97%)
South Garage	1,000	1,077 (108%)
Economy Lot	2,763	1,131 (41%)
Aggregate System	**7,031**	**5,633 (80%)**

Source: Jacobsen|Daniels (2023)

As shown in the previous table, Short Term, Long Term, and the South Garage are still reporting over 100% capacity. In these cases, it is assumed that the peak utilization for those products is at 100% and equals the current capacity. For the other parking products, the actual peak utilization numbers are used for the baseline utilization.

Approved forecasts for passenger enplanements were then used to forecast future facility requirements based on the existing baseline utilization numbers and the passenger growth percentages. **Table 4-27** shows the public parking facility requirements for all parking products at the Airport throughout the planning period.

Table 4-27 – Public Parking Facility Requirements

Parking Facility	Existing Capacity (spaces)	Forecasted Capacity (spaces)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
Short Term	184	184	261	282	302	323
Long Term	1,262	1,262	1,789	1,933	2,074	2,212
North Garage	1,822	1,765	2,502	2,703	2,900	3,094
South Garage	1,000	1,000	1,418	1,532	1,643	1,753
Economy	2,763	1,131	1,603	1,732	1,858	1,983
Aggregate System	**7,031**	**5,633**	**7,986**	**8,628**	**9,256**	**9,874**

Source: Jacobsen|Daniels (2023)

As shown, the forecasted growth for all parking products exceeds the existing capacity beginning in 2026. An additional 2,843 spaces in the aggregate system are needed to meet the demand of the 20-year planning period. Discussions with the Airport indicate that parking currently and regularly hits maximum capacity in several of the parking facilities. Thus, there is an immediate need for additional parking and space should be preserved for future parking facilities at the Airport. Future facilities will be further analyzed in the Development Alternatives section of this report.

4.4.2 Employee Parking Requirements

Employee parking is currently provided at a lot to the west of the terminal apron, at the intersections of the access road and Hockey Lane, which provides 257 spaces. Actual usage data (i.e., entry and exit counts) are not available, therefore an estimate of the existing lot's ability to meet baseline employee demand was based on input from Airport staff. This input has indicated that the existing lot is at 85% capacity at the peak times in the baseline year 2022. Based on the 85% current capacity assumption, the baseline usage for employee parking is 218 vehicles. Using passenger enplanements forecast growth percentages, **Table 4-28** shows the future facility requirements for employee parking.

Table 4-28 – Employee Parking Facility Requirements

Facility	Existing Capacity (spaces)	Forecasted Capacity (spaces)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
Employee Parking Lot	257	218	309	335	359	384

Source: Jacobsen|Daniels (2023)

Based on the forecasted growth, future demand will exceed existing capacity of the employee parking lot beginning in 2026. An additional 127 spaces are required over the 20-year growth period. Space for additional employee parking should be preserved to meet future demand.

4.4.3 Roadway and Terminal Curbside Requirements

Access to ALB is from and to the south, east, and north via a newly constructed interchange with Interstate 87, the Northway. The interchange (i.e., Exit 3) opened in November 2019 and provides direct access to Albany-Shaker Road which has access to the Airport's entrance and exit roadways. Albany-Shaker Road can also be accessed from the west via New York State Route 7. Field observations and discussions with Airport staff indicated that these roads are adequate for accommodating the future needs of the airport and thus there are no future improvement needs required.

The curbside portion of terminal roadways is where the primary pickup and drop-off functions are accommodated at the Airport. There are two curbside roadways at ALB: an inner road/curb and outer road/curb. The four-lane inner roadway has a southern section intended for passenger drop-off activities and a northern section intended for passenger pickup activities. Commercial vehicles utilize the two-lane outer roadway, accessing it through revenue control access gates. Current estimated curbside areas from Google Earth and airport documentation are as follows:

- Public Lane – 675ft
- Commercial Lane – 670ft
    - Limos and Hotel Shuttles – 170ft (25% of total)
    - Taxis – 200ft (30% of total)
    - Uber and Lyft – 135ft (20% of total)
    - Park N Fly – 165ft (25% of total)

Discussions with the Airport indicated that existing curbside is at 85% capacity at the peak times in the baseline year 2022. Using passenger enplanements forecast growth, **Table 4-29** shows the future facility requirements for terminal curbside requirements. The current percentage split amongst users of the commercial lane is carried forward in forecast years so that the same split remains.

Table 4-29 – Terminal Curbside Facility Requirements

Curbside Designation	Existing Capacity (ft)	Forecasted Capacity (ft)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
Public Lane	675	573	813	879	945	1,009
Commercial Lane	670	570	809	875	940	1,004
Limos & Hotel Shuttles	*170*	*143*	*202*	*219*	*235*	*251*
Taxis	*200*	*171*	*243*	*262*	*282*	*301*
Uber & Lyft	*135*	*114*	*162*	*175*	*188*	*201*
Park N Fly	*165*	*143*	*202*	*219*	*235*	*251*
Total	**2,015**	**1,714**	**2,431**	**2,629**	**2,825**	**3,017**

Source: Jacobsen|Daniels (2023)

Based on the forecasted capacity, future demand will exceed the existing capacity of the curbside. An additional 334 feet is required for both the public lane and the commercial lane over the 20-year growth period. It should also be noted that these areas are currently in review due to the upcoming terminal checkpoint development.

4.4.4 Rental Car Facility Requirements

Rental car operators have counters located in the passenger terminal building, as well as kiosks in the ready return area of the North Garage. Rental cars are picked up and returned on the ground level of the North Garage, and vehicles are serviced on sites located to the north of Runway 10 along Old Albany-Shaker Road. Service sites encompass 9 acres of land surrounding the Airport. Rental car (ready/return) spaces in the garage are as follows:

- Avis and Budget – 95 spaces (31% of total)
- EHI – 126 spaces (41% of total)
- Hertz – 86 spaces (28% of total)
- **Total Ready/Return – 307 spaces**

For purposes of estimating future facility requirements, ready/return spaces, customer-facing counters, and service sites are considered. Actual usage data (i.e., transactions) were not available, therefore an estimate of the existing facility's ability to meet baseline demand was based on input from Airport staff. This input resulted in the following assumptions:

Service Sites – Assumed to be adequate for future demand. No new Airport owned land would be identified for expansion of rental car services sites.

Customer-Facing Counters/Kiosks – Rental car counters within the terminal will be renovated and adjusted per the on-going terminal design and are assumed to be adequate for existing and future operations. Additional or expanded counters/kiosks within the garage will be defined with expanded ready/return lots.

Ready/Return Spaces – Assumed that existing ready/return spaces are at 85% capacity at peak times in baseline year 2022. With the expansion of Electric Vehicle (EV) infrastructure requirements, as well as typical growth operations, forecasted operations will be in line with enplanements forecasts to ensure that rental car parking areas are expanded in parallel with that demand.

Based on the 85% current capacity assumption, the baseline usage for rental car parking is 261 spaces. The current percentage split amongst rental car companies is carried forward in forecast years so that the same split remains. Using passenger enplanements forecast growth, **Table 4-30** shows the future facility requirements for curbside requirements.

Table 4-30 – Rental Car Facility Requirements

Facility	Existing Capacity (spaces)	Forecasted Capacity (spaces)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
Rental Car Total	307	261	370	401	430	460
Avis/Budget	*95*	*81*	*115*	*124*	*133*	*143*
EHI	*126*	*107*	*152*	*164*	*176*	*189*
Hertz	*86*	*73*	*104*	*112*	*121*	*129*

Source: Jacobsen|Daniels (2023)

Based on the forecasted capacity, future demand will exceed existing capacity of the rental car ready/return parking lot. An additional 153 total spaces are required over the 20-year growth period. Space for additional rental car parking should be preserved to meet future demand. Expanded capacity will be analyzed within the Development Alternatives section of this report.

4.5 Air Cargo Requirements

Air cargo facilities at ALB are located in the northeast quadrant of the airport property near the Runway 19 approach end. The facility includes a 70,000 SF building and associated approximately 370,000 SF apron area. Current cargo carriers operating out of the facility are UPS, FedEx, and Mobil Air Transport.

The current cargo building and apron are not at maximum capacity. The currently underutilized space will be expanded into by the current cargo operators. Similarly, the apron has space for additional aircraft parking without any pavement expansion.

Overall, the approved forecasts show modest growth for cargo tonnage. The Airport indicated a desire for future cargo expansion for both the building and parking apron. Major growth factors include new cargo operators, such as DHL or Amazon, locating operations at ALB. In terms of landside, the Airport also indicated a need for additional trucking and loading space, as well as employee parking.

For purposes of estimating future facility needs, it is assumed that the current capacities of the existing cargo building and ramp are at 75% and 60%, respectively. Cargo tonnage forecasts (2% per year) and cargo operations forecasts (0.8% per year) were used to estimate the future facility and apron, respectively. **Table 4-31** shows the future facility requirements for cargo facilities.

Table 4-31 – Cargo Facility Requirements

Facility	Existing Capacity (SF)	Forecasted Capacity (SF)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
Cargo Building	70,000	52,500	56,828	62,742	69,273	76,483
Cargo Apron	370,000	222,000	229,190	238,505	248,199	258,287

Source: Jacobsen|Daniels (2023)

Based on the forecasted capacity, future demand will exceed existing capacity of the cargo building requiring an additional 6,483 SF of space over the 20-year growth period. The cargo apron is within capacity with over 100,000 SF remaining in the 20-year timeframe.

Based on discussions with the Airport and Hub Point, who are the cargo strategic advisors, there is a desire for building expansion, beyond the 6,483 SF, for existing operations and the potential for a new entrant cargo operator. Specific needs are unknown at this time, however the area surrounding the current cargo facilities should be preserved for future development of additional cargo facilities if expanded demand is realized.

4.6 General Aviation Requirements

General Aviation (GA) requirements are developed to accommodate the Fixed Base Operator (FBO) at ALB as they continue to experience growth. In addition to the FBO, the Airport also has airport-owned private hangar facilities and T-hangars, as well as Maintenance, Repair, and Overhaul (MRO) facilities.

4.6.1 Based Aircraft Storage

The approved forecasts indicate 97 current based aircraft: 60 single-engine, 7 multi-engine, 19 jets, and 11 helicopters. Based on discussions with the Airport and the FBO, the based aircraft are stored in the locations shown in **Table 4-32.**

Table 4-32 –Based Aircraft Storage

Facility	Single-Engine	Multi-Engine	Jet	Helicopter
T-hangars	37 (61%)	4 (57%)	0	0
FBO	15 (25%)	0	19 (100%)	0
Private hangars	4 (7%)	1 (14%)	0	0
T-hangar tiedowns	4 (7%)	0	0	0
NYSP/ANG	0	2 (28%)	0	11 (100%)
TOTAL	**60**	**7**	**19**	**11**

Source: ALB and Million Air (2023)

4.6.2 Fixed Base Operator (FBO)

ALB has one FBO, Million Air, located in the southwest quadrant of airport property. The FBO currently operates two hangars with a combined storage space of 43,000 SF, as well as the adjacent apron (approximately 550,000 SF total). The FBO also leases one bay in the Bluebird hangar (approximately 5,000 SF) in the northwest quadrant of airport property.

The Airport is interested in expansion as both of the hangars are currently at capacity. Several of the current based aircraft customers are anticipating to upgrading their aircraft, and the new aircraft will not be able to fit in the current storage facilities. The newest large corporate jets (e.g., Gulfstream 650, Global Express 750) now have lengths and wingspans of over 100 feet and cannot fit within any existing hangars at the Airport. Currently, the FBO cannot house any new customers due to the lack of hangar space available for their aircraft. In addition, an existing initiative to establish a flight school at the Airport would require expanded hangar and apron parking capacity.

The approved forecasts indicate that based jets will grow from 19 in 2022 to 34 in 2041, as shown in **Table 4-33**.

Table 4-33 –Forecasted Based Jet Aircraft

Based Aircraft	2022	2026	2031	2036	2041
Jets	19	22	24	27	34
Net Increase	-	3	5	8	15

Source: Master Plan Forecast (2022)

This unconstrained forecast results in 15 additional jet aircraft at ALB during the planning period. As corporate jets vary widely in size, the specific hangar area needed to accommodate these future aircraft is unknown. Therefore, a planning estimate of 4,000 SF per jet was used for a mid-sized jet, and results in an estimated need for 60,000 SF of additional hangar space by 2041.

However, based on regular inquiries received by Million Air, there already appears to be a latent demand for corporate jet aircraft storage at ALB by companies in Albany, the Hudson Valley, and south to the NYC Metro Area. The FBO estimates a current need for expanded hangar capacity of approximately 50,000 SF to accommodate both existing and future demand. Therefore, the master plan recommends corporate hangar expansion in the short-term of up to 50,000 SF, with appropriate locations reserved for a total of 100,000 SF of new hangar space during the planning period.

While the overall apron adjacent to the FBO is approximately 550,000 SF, only approximately 185,000 SF is available for aircraft parking on the south side of the ramp. This apron space is used solely for transient aircraft, there are no based aircraft parked on the apron. The apron area directly in front of the FBO's north hangar is used for hangar and aircraft staging, not for parking transient aircraft.

Figure 4-12 – FBO Apron

Source: Google Earth and Million Air (2023)

Discussions with the FBO indicate that transient aircraft parking regularly reaches capacity during peak times so there is a desire for more apron space. In order to project the itinerant apron space needed during the planning period, the following parameters were considered:

- The existing itinerant apron is approximately 185,000 SF, which includes taxilanes that cannot be used for aircraft parking.
- The apron is roughly at 50% capacity during non-peak periods.
- During the average day of the peak month (typically August), the apron is at 100% capacity.
- During the peak days of the peak month, the apron can additionally be at 120% capacity.

Using the approved forecast growth, the percentage increase in forecasted GA itinerant operations is shown in **Table 4-34.**

Table 4-34 –Forecasted GA Itinerant Operations

	Existing Capacity (ops)	Forecasted Capacity (ops)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
GA Itinerant Operations	14,534	15,000	15,900	17,200	17,900	18,700
Percentage Increase		3.2%	6.0%	8.2%	4.1%	4.5%

Source: Master Plan Forecast (2022)

The percentage increase in GA itinerant operations is then applied to the existing capacity of 185,000 SF to determine itinerant apron facility requirements shown in **Table 4-35.** The future itinerant apron demand for 2041 shows the need for approximately 53,000 SF in additional apron.

Table 4-35 –Forecasted GA Itinerant Operations

	Existing Capacity (SF)	Forecasted Capacity (SF)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
Itinerant Apron	185,000	190,920	202,375	218,970	227,948	238,205

Source: Jacobsen|Daniels (2023)

4.6.3 Private Hangars and T-Hangars

The Airport owns and leases several private hangars in the northwest quadrant of airport property. There are currently two hangars (18,000 SF total) and one additional private hangar, known as Bluebird (20,000 SF). The Bluebird hangar has four bays: one is leased to the FBO, one is leased to a private individual, and the other two are leased to Cape Air for maintenance. ALB currently has three 10-bay nested T-hangars and one 11-bay nested T-hangar totaling 41 units of aircraft storage for general aviation aircraft.

The approved based aircraft fleet mix breakdown is 60 single-engine (SE) and 7 multi-engine (ME) aircraft at ALB. There are four based SE and one based ME located in the private hangars. There are 11 based helicopters and two ME aircraft operated by and located at the New York State Police (NYSP) and Air National Guard (ANG) facilities. These are not included in aircraft storage facility requirements and those facilities are assumed to be adequate for the future needs of the

NYSP and ANG. Using the based aircraft splits and if both the private hangars and T-hangar tiedown parking remains constant, the need for space for SE and ME aircraft is shown in **Table 4-36.**

Table 4-36 –SE and ME Aircraft Facility Requirements

Facility	Existing Capacity (aircraft)	Forecasted Capacity (aircraft)				
		2022	PAL 1 2026	PAL 2 2031	PAL 3 2036	PAL 4 2041
T-hangars	41	41	39	37	36	32
Private Hangars	5	5	5	5	5	5
T-hangar Tiedowns	4	4	4	4	4	4
TOTAL	**50**	**50**	**48**	**46**	**45**	**41**

Source: Jacobsen|Daniels (2023)

As indicated in the approved forecasts, there is an overall decrease in SE and ME aircraft based on national trends. However, discussions with the Airport and FBO indicate that due to ALB's geographic location, they expect the desire for T-hangars to remain constant. While there is no official waiting list, the FBO indicated that they receive regular inquiries regarding hangar space at the Airport. There is space for additional T-hangars in the current T-hangar area in the southeast quadrant; that area should be retained for potential additional T-hangar construction. Additional options will be explored in the development alternatives of the master plan.

4.6.4 Maintenance, Repair, and Overhaul (MRO) Facilities

ALB has two MRO facilities at the Airport: CommuteAir (subsidiary of United Airlines) and Piedmont (subsidiary of American Airlines).

CommuteAir

CommuteAir occupies two hangars and office space in the northwest quadrant of the airport property (31,000 SF total). CommuteAir is currently servicing Embraer 145 aircraft and is expecting to upgrade to Embraer 175 aircraft in the second half of the 20-year planning period. The size, space, and layout of their facilities are adequate for current E145 operations. However, the hangar door heights are approximately 30 feet tall and cannot fit the Embraer 175 which has a tail height of 32 feet. If CommuteAir were to relocate from these hangars, they could be repurposed for use by any corporate jets, including the new larger sizes.

The employee parking lots are sufficient, although outside entities sometimes park at the lot adjacent to their office space. There is a desire to relocate the fencing that runs along the adjacent cul-de-sac and the Airport is considering this in the future. Regarding the layout of the two hangars being perpendicular to each other, this does not cause an issue and there is no desire to redesign hangars to a linear layout.

Piedmont

Piedmont is located in a hangar in the southwest quadrant off the GA apron, near the Runway 1 approach end (30,000 SF). Piedmont does not occupy the entire building; occupied areas include the main hangar space on the north side while the south office space remains vacant (previously occupied by CommuteAir). There is a desire to rent the additional office space so that offices located inside the hangar may be relocated to give space for shop and maintenance areas.

Piedmont currently services Embraer 145 aircraft but expects to upgrade to Embraer 175 aircraft within the planning period. The Embraer 175 aircraft will not fit in the current hangar as the tail height is too high, so when these upgrades occur, there will be a need for larger hangar space. The current hangar door is approximately 23 feet tall. If Piedmont were to relocate from this hangar, it could not be repurposed for large corporate jets and would only be sufficient for small and mid-size jets.

Regarding Piedmont's operations, the company is currently growing and expects to double the total aircraft fleet from approximately 50 to 100 in the future. Piedmont is unsure of size requirements for future facilities, as it would depend on what aircraft are being serviced, but would need at least three overnight spaces within a future hangar. ALB's geographical location is essential to the existing Piedmont operation, due to the close proximity to the primary northeastern hubs.

During discussions with Piedmont, they did note several issues with the current facilities. Aircraft at Million Air complete run-ups just north of the Piedmont parking lot. There is a desire for a jet blast wall or other similar installations to mitigate the overall jet blast from the run-up operations. Inside the hangar, there is a desire for an upgraded break room as well as servicing for heat and air conditioning. The power supply is inadequate for the needed electronics including space heaters for temperature affected materials. The employee parking lot on the north side is frequently almost at or at full capacity, especially during overnight shifts. Options will be analyzed to alleviate existing capacity constraints within the existing facility location.

Future MRO Facilities

The existing demand is four Embraer 145s for CommuteAir and three Embraer 145s for Piedmont. Both companies indicated a future upgrade to Embraer 175s, which are approximately 30% larger than the 145s. The future demand is based on airline operational needs and business strategies, and the current aircraft demand will remain consistent. Both facilities will need to be replaced as neither has the height to accommodate the E175s. For planning purposes, two facilities of 40,000 SF each with appropriate apron/taxilane access should be accommodated.

4.7 Support Facilities

Requirements for support facilities were developed to include airport maintenance facilities, Air Traffic Control (ATC), Aircraft Rescue and Firefighting (ARFF) facilities, and aircraft fueling facilities.

4.7.1 Airfield Maintenance Facilities

The Airport has a dedicated Airport Maintenance and Snow Removal Equipment (SRE) facility area located in the northeast quadrant of the airport, adjacent to the control tower. **Figure 4-12** depicts that layout of the existing 4-acre complex, containing approximately 38,000 square feet of storage space. In addition, vehicle and sand storage facilities are located in the southwest and northwest quadrants, respectively.

Figure 4-13 – SRE & Maintenance Buildings

The Airport has determined the equipment and storage buildings are needed to maintain the Priority One clearing areas of the airfield satisfy FAR Part 139 requirements. As such, the vehicles and SRE buildings should be maintained throughout the planning period. The airport houses and maintains additional vehicles for maintenance and support beyond those required for the Priority One clearing. The existing airport maintenance complex includes room for expansion, and Airport Operations has indicated a goal of constructing additional unheated storage space for these vehicles and equipment. The location for the additional maintenance facilities is reviewed in the Development Alternatives section of this report. It is acknowledged that this potential expansion may not be eligible for FAA funding as it is beyond the requirement of the Airport's Part 139 operating certificate. Nevertheless, the master plan will ensure that such facilities are planned and located in an appropriate layout for the long-term planning period.

4.7.2 Air Traffic Control

The Air Traffic Control Tower (ATCT) is located in the northeast quadrant of airport property. The current location is sufficient, and the Airport is in the process of completing repairs and upgrades to the current facility. ATC personnel indicated that the FAA is purchasing electric vehicles and there will be a need for charging stations onsite. The height of the ATCT requires the removal and maintenance of trees within the northeast quadrant of the airport to maintain the line-of-sight to the runway approaches and taxiways. All other areas of the airfield have a clear line-of-sight to the ATCT.

4.7.3 Aircraft Rescue and Firefighting (ARFF)

The Airport's Aircraft Rescue and Firefighting (ARFF) services are accommodated in an approximately 18,000 square foot facility located in the southwest quadrant of the Airport, within the GA/FBO apron and facilities. The 25-year-old station includes six vehicle bays, and 8,000 square feet of supporting space. Based on the current and forecast passenger airline service, with a Boeing 737 critical aircraft (i.e., ADG III), the current ARFF Index C is not forecast to change during the planning period. The existing station and equipment meet the federal requirements and will be maintained throughout the planning period.

Although the facility satisfies FAR Part 139 requirements, the station is undersized for its current and future staff, equipment, and services provided to the Airport as a whole, including the support provided to the terminal complex. The facility and staff would benefit from additional vehicle bays, as well as living quarters, office space, etc. **Table 4-37** through **Table 4-39** show the needs based on existing operations and local practices (i.e., which are above the minimum federal mandates per Part 139).

Additionally, the existing location of the ARFF building is constrained due to public roads, adjacent buildings/hangars and the FBO/general aviation apron. There is no space to improve the facility in its current location. Similarly, the station prevents the needed expansion of adjacent general aviation facilities. The apron in front of the Station is marked 'NO PARKING FIRE LANE', but as a non-movement area, aircraft and service vehicles may pass through the station's airside ramp without the control of the ATCT. During summer peak GA activity and winter deicing operations, aircraft must be prevented from encroaching into this area to maintain safety and response requirements. On the non-secure side, vehicle parking for the FBO, US Customs, and the Aeronautical Technology Institute (ATI) school overflow to the ARFF station's parking lot at times. The proximity of these other airport activities prevents effective segregation from the ARFF station.

Therefore, the long-term relocation of the ARFF Station is recommended to a location that permits for the provision of all facilities for existing and future needs, without the potential for impacts to other Airport services. Options for relocation of the ARFF facility are analyzed as part of the development alternatives of this master plan, following the site selection guidance of FAA AC 150/5210-15.

Figure 4-14 – Existing ARFF Station

Per FAA policy, relocation and other improvements should be considered as the facility reaches 40-years in age during the latter half of the planning period. This master plan provides the initial review and reservation of appropriate locations for a new station. It is acknowledged that the tables below list facilities that exceed those needed for Part 139, and thus may not be fully eligible for AIP funding.

Table 4-37 – ARFF Business Area Office Requirements

Office	Current	Future Need	Deficit
Office – Chief	1	1	0
Office – Deputy Chief	0	1	1
Office – Training Chief	0	1	1
Office – Training Assistant	0	1	1
Office – Captain	1	2	1
Office – Lieutenant	0	2	2
Office – Codes Plans Review	0	1	1
Training Room	1 (24 people)	1 (40 people)	
Training Storage	140 SF		
Radio Room/Dispatch	1	1	0
Decon Room/Laundry	1	1	0
Gear Room	0		
Secured Document Storage	140 SF		
First Aid Room	56 SF	Double	
EMS Storage – Secured	55 SF	Double	
EMS Storage – Unsecured	108 SF	Double	
Hazmat Storage	80 SF	double	
SCBA Filling Room/Workshop	100 SF	Double	
Extinguisher Storage Room	95 SF	Double	
Custodial Storage	145 SF	Double	
Equipment Storage Room	160 SF	Double	
Foam/F3 Storage	Racks for 7 265 Totes	Racks for 10 Totes	
Dry Storage	Racks for 10 Pallets	Racks for 20 Pallets	

Source: ALB ARFF management (2023)

Table 4-38 – ARFF Living Area Requirements

Living Area	Current Room (Capacity)	Future Need (Capacity)	Deficit
Kitchen	1 (6)	1 (8)	
Firefighter Bunkrooms	4 (8)	6 (12)	
Captain Bunkrooms	2 (4)	2 (4)	2
Radio Room Bunk	1	1	0
LT Bunkrooms	1	1	0

Source: ALB ARFF Staff (2023)

Table 4-39 – ARFF Apparatus and Equipment Requirements

Equipment	Current	Future Need	Deficit
Extra Large Vehicles	3	3	0
Large Vehicles	1	1	0
MCI Trailer	1	1	0
Hazmat Trailer	1	1	0
UTV/Parking Garage High Pressure Unit	1	1	0
Pickup Truck	1	1	0
Chief Truck	1	1	0
DC Truck	0	1	1
Stair Truck	0	1	1
Foam Truck	0	1	1

Source: ALB ARFF Staff (2023)

4.7.4 Aircraft Fueling Facilities

Aircraft fueling facilities are located at a single fuel farm located in the northwest quadrant of airport property which is operated by Million Air. The fuel farm consists of nine tanks with a total capacity of approximately 400,000 gallons. In addition, there is a glycol mixing station. While the Airport indicates that the tank sizes are currently adequate, there is space for an additional large tank in the northeast quadrant of the fuel farm. In addition, the fuel farm layout is not optimal and causes some constraints due to tank location and truck flow. There is a desire for an additional pad with a canopy on the south side of the farm so that trucks can access the glycol mixing station; currently, the trucks are accessing it through the Avgas rack which can cause delays while the glycol trucks are filling and Avgas trucks are needing to be filled.

Future facility requirements for fuel tank capacity were analyzed using approved forecast growth for total operations. **Table 4-40** shows the future facility requirements for fueling operations.

Table 4-40 – Fuel Facility Requirements

Facility	Existing Capacity (gallons)	Forecasted Capacity (gallons)			
		2026	2031	2036	2041
Fuel	400,000	495,152	512,900	538,654	564,381

Source: Jacobsen|Daniels (2023)

In addition to the fuel farm, there was previously a self-serve Avgas facility located at the T-hangars. This tank was removed in 2022 due to its deterioration and the inability to be refurbished. Since the removal of the tank, aircraft located at the T-hangars must taxi over to the FBO ramp to get fuel. There is a need to have another self-serve Avgas facility at the T-hangars in the future, for convenience and safety (eliminate unnecessary runway crossings). The decommissioned fueling area should be retained for that purpose.

5 Development Alternatives

To satisfy the facility requirements identified in **Chapter 4**, numerous concepts, site configurations, and development options were created and reviewed for the various components of the Airport. In many circumstances, multiple alternatives were identified, but eliminated early in the planning process from further consideration. The concepts deemed most reasonable to support the long-term operational sustainability of the Airport were identified and carried forward in the evaluation.

5.1 Introduction

This chapter includes separate concepts and configurations for the airfield, passenger terminal facilities, air cargo, general aviation, and support facilities. The number of potential recommendations is substantial; however, it is emphasized that although projects may be desired, they may not necessarily be financially or environmentally feasible. As such, recommendations presented within this chapter do not ensure that they will be implemented and will require further feasibility assessments and environmental reviews should they be advanced. Chapter 6 of this Master Plan provides an environmental overview of the Airport as a whole and identifies existing environmental conditions. The alternatives and concepts discussed in this chapter consider the findings presented in Chapter 6.

The overall effort refined the final strategy into actionable recommended projects for implementation in phases. The philosophy of the Albany County Airport Authority (ACAA) and this Master Plan is to develop a comprehensive and integrated plan for all foreseeable needs over the 20-year planning period, but only construct new facilities as actual needs are confirmed.

Regardless of timeframe or activity level, the overarching principles guiding facility recommendations are to provide an elevated level of customer (i.e., passenger) service and promote regional economic wellbeing while accommodating the evolving business model of the airlines and airport tenants. For some functional areas, such as the airfield, the logical recommendations were distinctly apparent as they are driven largely by Federal Aviation Administration (FAA) design standards as well as by existing infrastructure and available property. In contrast, improvements related to the passenger terminal buildings and vehicle parking have greater variability in their configuration. This is due to potential financial feasibility and implementation challenges and their influence on surrounding Airport facilities.

During the identification of facility requirements, it became evident that the Master Plan would not consist of all-encompassing or competing alternatives for development of the Airport. Rather, the concepts and alternatives presented consist of a series of separate improvements that are assembled into the overall strategy. As such, individual components were reviewed and recommended separately to develop the preferred overall improvements program.

5.2 Airfield Development Concepts

This section identifies and evaluates potential airfield improvements that will enhance the overall safety, efficiency, reliability, and capacity of the airfield at ALB. Aircraft flows between the runway system and various functional areas (e.g., terminal area, air cargo, and general aviation) have been considered. The concepts were developed through qualitative review of the following considerations:

- FAA airfield design standards
- Construction and operating costs
- Operational changes and considerations
- Construction impacts, including ease of phasing and construction
- Safety and reliability considerations
- Airspace considerations
- Environmental considerations
- Community acceptance

As discussed within previous sections of the Master Plan, the goal is to plan for a safe and operationally efficient airfield. This can be accomplished by meeting the following objectives:

- Adhere to FAA design standards, reducing/eliminating Modifications of Standards
- Accommodate all existing and projected users as practical
- Reduce runway crossings (particularly in the middle third of runway) to improve safety
- Reduce risk of pilot confusion
  - Reducing the number of taxiways intersecting at a single location
  - Eliminating acute angle intersections
  - Increasing the pilot's situational awareness (proper signage and marking)
  - Avoiding wide expanses of pavement
  - Increasing visibility to other aircraft
- Determine the ultimate Airport Layout

The Facility Requirement chapter concluded that additional airfield facilities are not needed for capacity purposes. This section considers potential needs for safety improvements, including FAA established design standards, which have been revised and expanded in the past several years. Additionally, alternatives seek to improved airfield accessibility to locations on the airport that could be developed for aeronautical use. This review includes the three key components of the ALB airfield: Runways, Navigational Aids, and Taxiways.

Airfield facility requirements are primarily determined by the critical aircraft (aircraft with the longest wingspan, highest tail, and fastest approach speeds) that conducts "regular use" of the airport as a whole, and also to specific runways and terminal/landside facilities. FAA AC 150/5000-17 defines "regular use" as 500 annual operations, including both itinerant and local operations but excluding touch-and-go operations, as presented in Chapter 4.

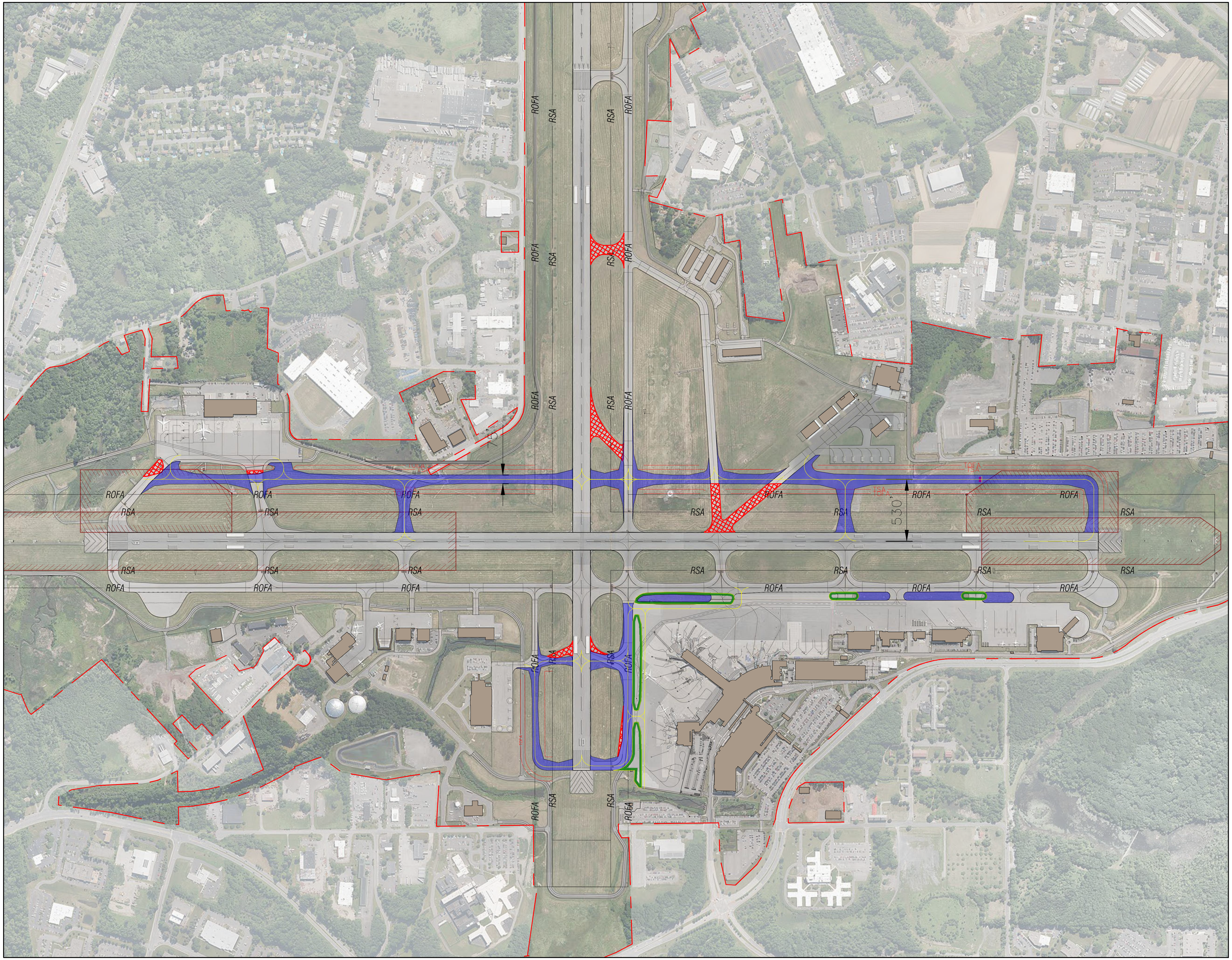
5.2.1 Runway and Navigational Aids (NAVAIDs)

The facility requirement evaluation identified the need for both runways in their current configuration, length and width, as well as with the existing equipped NAVAIDs. The evaluation acknowledged that crosswind coverage provided by the primary Runway 1/19 justifies crosswind Runway 10/28 for smaller aircraft per FAA policy. However, based on regular current use by larger commercial aircraft and frequent westerly winds, Runway 10/28 must be retained and maintained for Airplane Design Group (ADG) III aircraft throughout the planning period. As discussed in Chapter 4, Section 4.2.3, the crosswind coverage is not adequate for a majority of the C-III commercial aircraft during the operational hours of the winter months.

No additional NAVAIDs are needed at ALB. However, the current Instrument Landing System (ILS) for Runway 1 is supported by a MALSR lighting system with Special Authorization (SA) for Category II procedures. It is important the MALSR approach light system be maintained with the SA capability. As discussed in Section 4.2.5, the MALSR is currently in very poor condition and in need of immediate replacement. As an alternative, the FAA could upgrade the approach lighting to a higher capability ALSF-II system; however, the Airport's needs include the Category II capability which are met through the SA Category II approach capability with a MALSR system. The MALSR system is adequate as long as it can continue to support this capability. Pursuing an upgrade to the ALSF-II system is not a priority, as long as the SA CAT II approach can be maintained via the current MALSR system, due to the high cost of installation, maintenance, and the downtime in which a full ILS approach would not be available to pilots. Lastly, it is noted that the system is owned by the FAA's Airport Technical Operations (ATO) Division and requires coordination for the system's replacement to ensure the resiliency and safety of ALB's primary approach.

5.2.2 Taxiway Alternatives

Aircraft ground movement at ALB is supported by a system of taxiways providing access to all portions of the airfield. However, the system is set up to serve the western quadrants of the airfield where the majority of aircraft activity is located (e.g., passenger terminal, FBO, and MROs). Additionally, portions of the existing taxiway system are considered non-standard with regard to current FAA design standards or are such that an improved configuration could reduce the risk of pilot confusion and thus a runway incursion. The following taxiway alternatives were developed with the aforementioned considerations and adherence to FAA design standards, and depicted in **Figure 5-1**.



ALBANY
INTERNATIONAL AIRPORT

GRAPHIC SCALE (FEET)
0 400 800 1600

LEGEND

Proposed Airfield Pavement

Proposed Airfield Pavement Removal

Airport Property Line

Figure 5-1
Airfield Alternatives

Full Parallel Taxiway Alternative

A majority of the future landside development will be located on the eastern side of the airfield (as will be discussed later in this chapter). As such, a full parallel taxiway located east and serving the primary Runway 1-19 would prevent unnecessary runway crossings by aircraft and provide access to portions of the airfield that can be developed for aeronautical use.

The proposed parallel taxiway is depicted at 75 feet wide, following ADG IV and Taxiway Design Group (TDG) 5 standards, allowing for use by Airbus A300 widebody aircraft utilized by the cargo operators discussed in Chapters 3 and 4. The taxiway would require an offset of 530 feet from the Runway 1-19 centerline (greater than the FAA minimum of 400 feet) due to the existing ILS glideslope facilities located east of both ends of the runway. Additionally, the Very High Frequency Omni-directional Range (VOR) facility would need to be relocated or removed to construct the taxiway.

The Full Parallel Taxiway Alternative includes the following improvement:

- Addition of crossing Taxiways 'B' and Taxiway 'E', as these location provide nearly ideal exit locations for landings on Runway 1/19.
- Removal of portions of Taxiways 'D' and 'G' as having more than 3-nodes at their intersection
- Modification of Taxiways 'M' and 'Q' to mitigate the nonstandard direct apron-to-runway access.
- Removal of Taxiway 'J' due to non-standard intersection angles. The function of Taxiway 'J' will be replaced when the east side parallel taxiway is constructed.
- Update existing taxiway connector fillets to current FAA standards.

The parallel taxiway will require relocation of a portion of the existing vehicle service road, as well as a small amount of property acquisition from the Town of Colonie (approximately 0.3 acres) due to the safety areas in the northeast quadrant of the airfield.

Table 5-1 – Full Parallel Taxiway Summary

General Layout	
Provides a new parallel taxiway to the main runway that will prevent the need for runway crossing and provide access to developable areas of the airfield. Runway offset is planned for 530 feet and width of 75'.	
Opportunities	**Constraints**
✈ Provides more efficient aircraft movement for developments proposed in the Northeast and Southeast Quadrants ✈ Provides access to airfield areas with aeronautical development potential ✈ Brings current taxiway connectors to FAA design standards ✈ Improved safety and efficiency	✈ Requires relocation/removal of VOR ✈ Requires realignment of service road in Northeast Quadrant ✈ Requires property acquisition in Northeast Quadrant ✈ Presence of wetlands in Southeast Quadrant ✈ High cost of over $50 million

Taxiway 'C' Realignment

Taxiway 'C' is the parallel taxiway serving the south side of Runway 10/28. The portion of the taxiway located in the Southwest Quadrant is currently co-located with the Terminal Apron where aircraft are pushed-back from the gates. As such, this portion of Taxiway 'C' is a Non-Movement area not under the control of Air Traffic Control (ATC). Additionally, minimum standard runway to taxiway separation is not maintained (i.e., runway-taxiway separation tapers to as low as 350 feet starting from the last 600 feet towards the Runway 10 end connector).

This alternative depicts realigning Taxiway 'C' to meet the standard 400-foot runway to taxiway separation, and adding a separate terminal apron taxilane. This configuration would properly delineate aircraft movement within the terminal apron give back control of the full length of Taxiway 'C' to ATC. However, additional modifications to the terminal footprint layout of Concourse A will be required as aircraft pushing back from the gates would result in encroaching on the realigned Taxiway 'C' TOFA and TSA. As part of this project, the geometry of Taxiway 'K' on the south side of the runway should be updated to a standard 90 degree angle.

Table 5-2 – Taxiway 'C' Realignment Summary

General Layout	
Realign Taxiway C to a standard 400 foot offset, providing a clear delineation between the terminal non-movement area and the ATC-controlled Taxiway 'C'	
Opportunities	**Constraints**
✈ Improve Taxiway 'C' to standard offset distance to Runway 10-28 ✈ Can enable Taxiway 'C' under ATC control, with Concourse B modification ✈ Provides separation from taxiway to terminal apron	✈ Reduces terminal apron space ✈ High costs, without increasing capacity

Taxiway 'P' Extension

Currently, the end of Runway 10 end is serviced by only one taxiway exit, which connects to Taxiway 'C'. As such, during conditions in which Runway 28 is active, landings where aircraft conduct a full rollout are required to taxi into the non-movement area on the commercial terminal apron with the existing Taxiway 'C' configuration. Aircraft landings where the destination is anywhere north of Runway 10/28 should have the ability to exit to the north and therefore avoid crossing the active runway.

This alternative depicts an extension of Taxiway 'P' connecting to the Runway 10 end. This would allow for any aircraft landings to circumvent the commercial terminal apron, especially for aircraft destined for the Northwest and Northeast quadrants. The taxiway width is shown as 50 feet for the current critical aircraft. At the time of the project, consideration should be given to a larger 75 foot width for use by Airbus A300 aircraft if justified by regular use. As part of this project, the geometry of Taxiway 'K' on the north side of the runway should be updated to a standard 90-degree angle.

Table 5-3 – Taxiway 'P' Extension Summary

General Layout	
Taxiway 'P' Extension to the west end of Runway 10 to improved safety and efficiency.	
Opportunities	**Constraints**
✈ Provides more efficient aircraft movement ✈ Improved safety by reducing runway crossings ✈ Satisfy FAA design standards ✈ Improved geometry of Taxiway K	✈ Additional facility to maintain

Direct Apron-to-Runway Access

Section 4.2.7 identified the existing non-standard conditions where runway access is provided from an airport apron, without the need for a turn. This is now a non-standard taxiway configuration as this geometry may increase the potential for pilots to enter the runway inadvertently. Advisory Circular 150/5300-13B recommends eliminating these configurations when the taxiway is reconstructed. Each of these configurations at ALB is recommended to be addressed during the planning period. The main terminal apron includes four of these non-standard layouts, but reconstruction in not needed in the next 10 years. As such, the upcoming terminal apron rehabilitation project (design 2025) will use that opportunity to evaluate the feasibility of addressing this runway access as part of the apron design. ALB will work with FAA to determine if the apron rehabilitation can incorporate the taxiway improvements in each of the four locations.

5.3 Passenger Terminal Building

While the FAA, pilots, and controllers see the airport as a system of runways, taxiways, and airspace, with various support facilities, passengers see the terminal building as the face and front door of the Airport. The terminal building is often referred to as the gateway to the community. The airline passenger is often unaware or indifferent to the remainder of the airport beyond the terminal complex. For this reason, the passenger terminal convenience, amenities, and operation are of critical importance to the Albany County Airport Authority (ACAA).

Prior to COVID-19, the Airport had reached 1.5 million annual enplanements, with the master plan forecast exceeding 2 million in 20-years. As existing terminal complex deficits have already been identified, potential future passenger growth will result in further inconvenience and impacts to passengers. To address these, this section identifies potential improvements and concepts for the ALB passenger terminal. The Master Plan's terminal development evaluation was approached in the following three stages:

- ✈ Overall Location and Terminal Improvement Models
- ✈ Short-term Concepts and Ongoing Projects
- ✈ Long-Term Development Concepts

5.3.1 Overall Location and Terminal Improvement Models

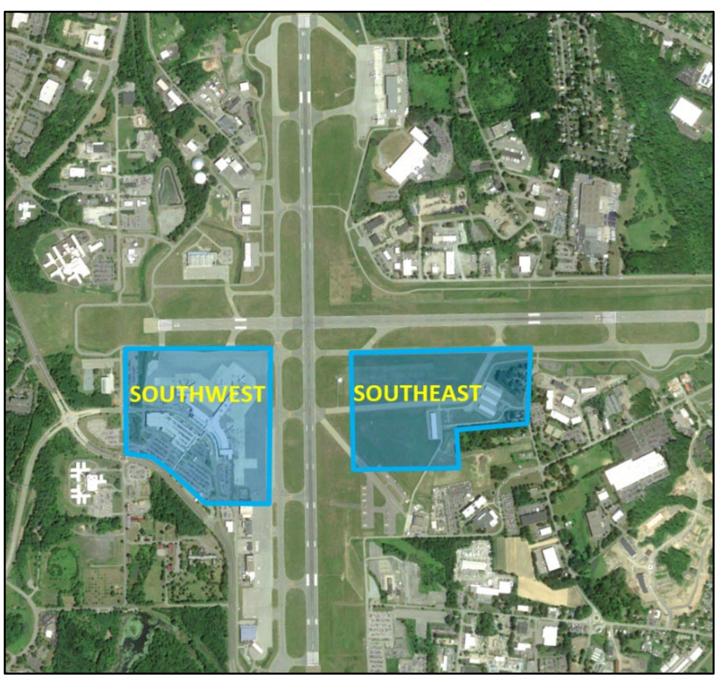
The initial step in the terminal planning included addressing two broad questions:

1. Should ALB improve/expand the passenger terminal in the current or an alternate location?
2. What terminal building configuration would work best in the long-term?

The first question is fairly rhetorical in that all previous infrastructure (buildings, parking, curbside, etc.) is provided in the existing Southwest Quadrant of the airfield, including substantial investment in improved facilities over the past 20 years. However, the current location has no remaining undeveloped area for expansion. Therefore, additional requirements can only be accommodated by rebuilding or expanding existing facilities, or replacing support buildings with those directly serving passengers. As an example, to address the identified passenger parking deficit, additional parking capacity can only be provided remotely, or via additional structured parking garages.

If the Airport was to legitimately consider relocating the terminal complex, a larger available location would be needed. As discussed throughout the master plan, the airport is ‘land poor’, with few undeveloped areas and none with the size necessary to be considered for a new terminal facility. **Figure 5-2** below identifies property in the Southeast Quadrant available for aeronautical developed with proximity to Interstate 87; however, it can be seen that this site is smaller than the space available in the current terminal area. Therefore, no further evaluation for relocating passenger facilities was considered in this study.

Figure 5-2 – Potential Terminal Complex Locations



The second question regarding the terminal building configuration was evaluated early in the terminal planning effort. The specific question involves how the Airport can best expand the terminal (i.e., security checkpoint, departure holdrooms, concessions, etc.) as activity grows within the space available. For this effort, several models or schematic concepts were identified early in the planning effort. This initial 'brainstorming' activity provides a very high-level review that provide a foundation for the ultimate recommendation based on overall practicality and feasibility . Three of these early concepts are described below in **Tables 5-4, 5-5**, and **5-6**.

Table 5-4 – Integrated Terminal and Concourses

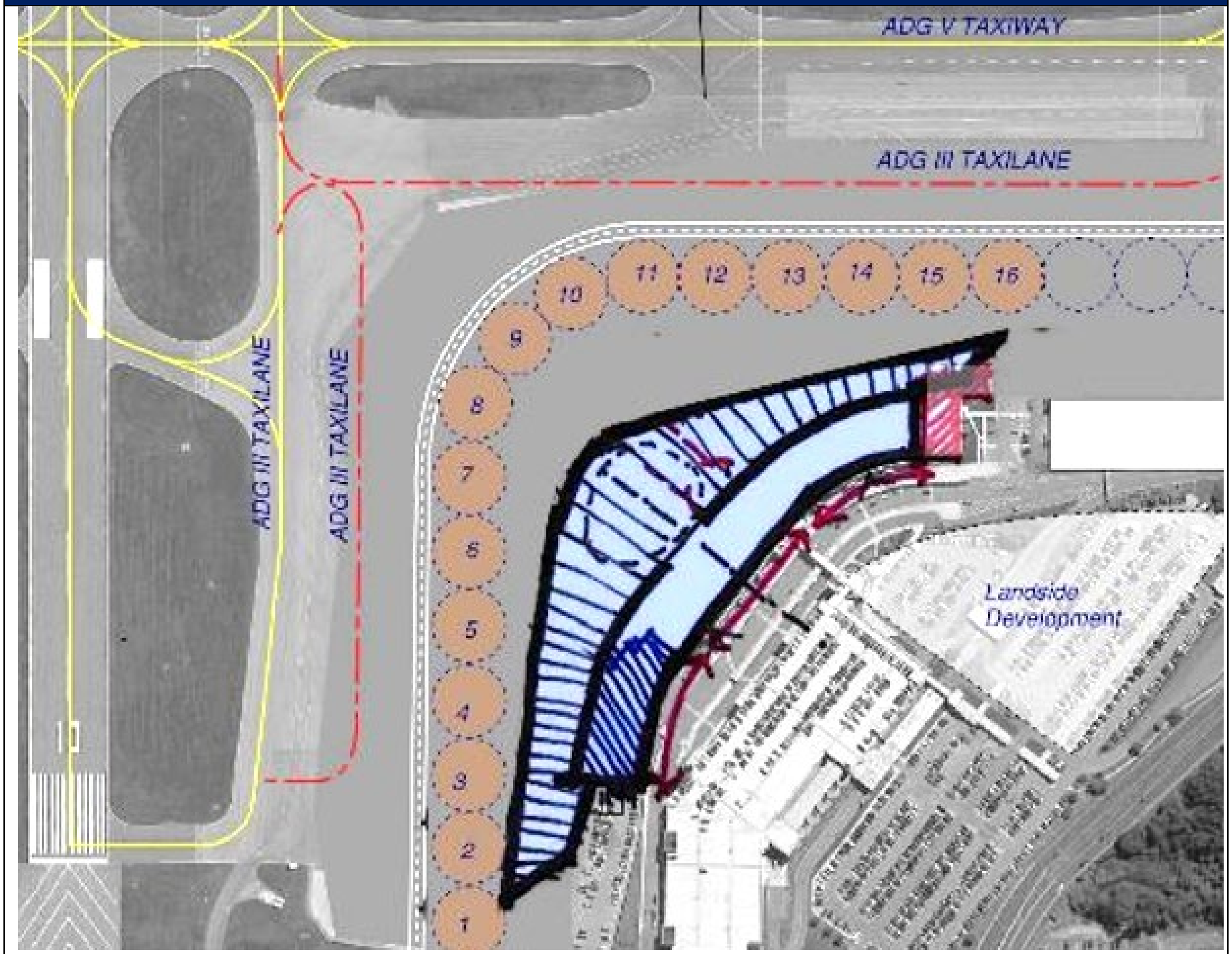
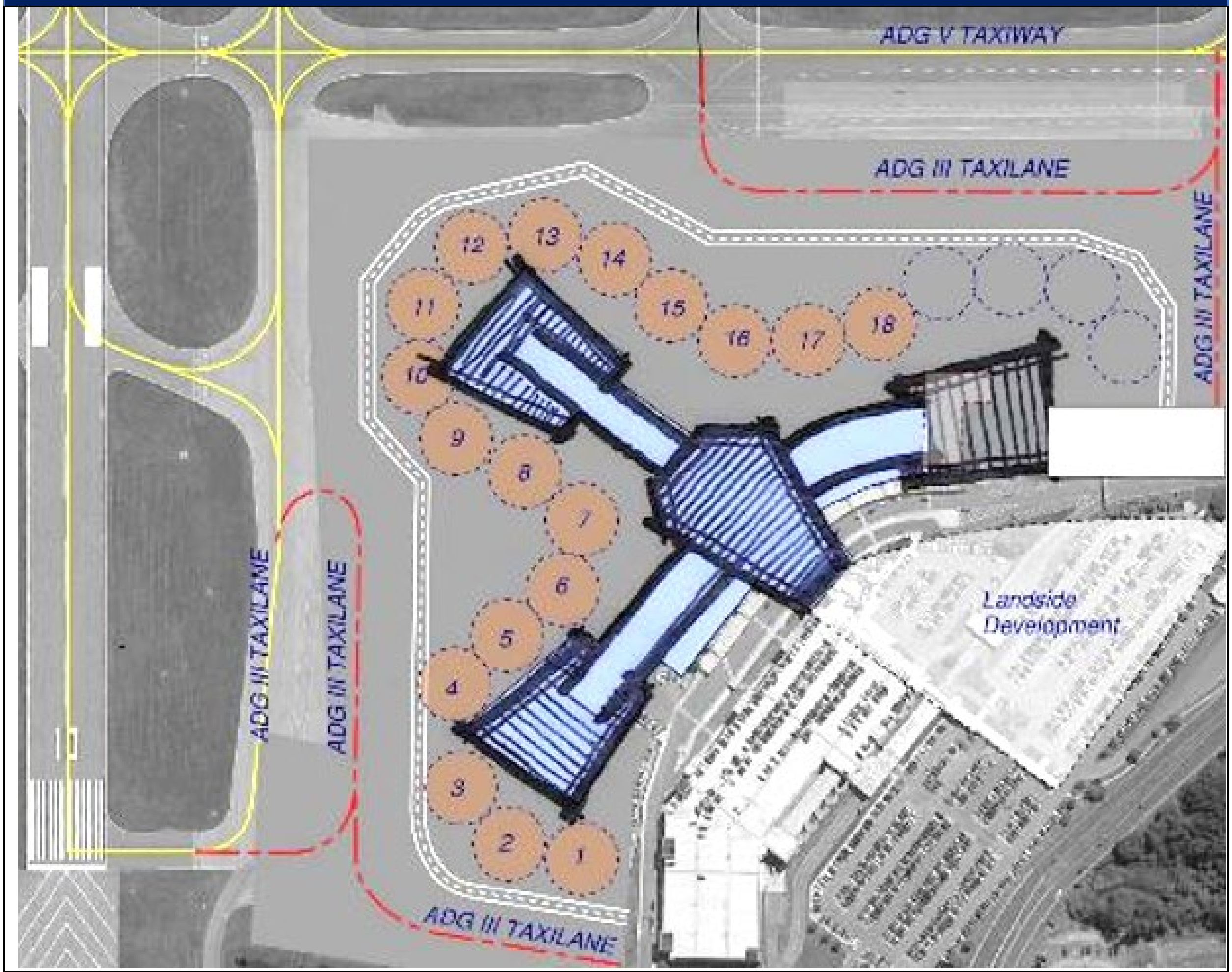
<table>
<tr><th colspan="2">General Layout</th></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">The current terminal model consists of a traditional terminal headhouse, with corridors that connect to the concourses and gates. This concept changes that arrangement by integrating the headhouse with the holdrooms/gates.</td></tr>
<tr><td>Advantages:
✈ Potential for larger total building area
✈ Retains existing curbside/parking
✈ Improved integration of concession and other services</td><td>Disadvantages:
✈ Complete replacement of the existing concourses
✈ Difficult construction phasing
✈ High construction costs</td></tr>
<tr><td colspan="2">Source: Gensler</td></tr>
</table>

Table 5-5 – Expanded Terminal to Southwest

General Layout	
	
During the initial terminal planning, the most critical facility shortfall identified was the TSA passenger security checkpoint processor. The location of the terminal curb hinders expansion. This model consists of moving the security checkpoint and passenger ticketing/check-in hall to the southwest side of the curbside. Thus, locations used for parking would be repurposed to enable expanded processing facilities.	
Advantages: ✈ Potential for larger total building area ✈ Retains existing curbside and access ✈ Retains the general location of concourse and gates	Disadvantages: ✈ Increases the distances (walk time) from ticketing to departure halls and gates ✈ Requires redevelopment of existing parking facilities ✈ Requires replacement of existing parking, adding to the current deficit
Source: Gensler	

Table 5-6 – Expansion of Existing Facilities (Headhouse and Concourses)

General Layout



This schematic layout addresses the disadvantages above, with a more traditional and incremental approach to providing additional facilities. The concept would first expand the headhouse, both landside and airside, to provide additional space for security screening, including expansion over the curbside. The existing concourses would also be expanded over time as needed.

Advantages:	Disadvantages:
✈ Phased approach with expansion as needed through the planning period ✈ Retains the general location of all existing facilities ✈ Cost effective development approach	✈ Layout may be limiting if growth exceeds expectations ✈ Retains separation of existing gate areas

Source: Gensler

Each of these concepts build upon the existing roadway and curbside layout. Other schematic layouts were also developed, including variations on the above three. Others included a new terminal building within the existing site, but were considered impractical, unnecessary, and too costly. Per the above schematic layouts, the traditional **Expansion of Existing Facilities** was selected as the most practical approach to satisfy passenger requirements at ALB. This approach is integrated into the remaining terminal planning efforts.

5.3.2 Passenger Terminal Requirement Summary

The Airport's approach to terminal development planning includes identifying expansion development alternatives that can accommodate all potential needs during the 20-year planning period (and beyond), but only constructing facilities as actual demand develops. For the terminal program, space needs were separated for analysis by processor and function as detailed in Section 4.3. A summary of these passenger terminal needs is listed below:

- Check-In Hall (departing passengers) – Some congestion during peak periods. Expansion need is anticipated in the long-term.
- TSA Security Checkpoint (departing passenger processing) – Strong need for current expansion for security queuing, circulation, and processing. Based on early identification of this need, improvements were commenced by ACAA in 2023, as described below.
- Departure Concourses – Overall size is currently adequate, but configuration leads to congestions in portions of the concourses. The existing configuration could be modified to reduce gate crowding. Passenger growth will require hold room expansion in the long term. The lower-level gates on Concourse A should be relocated to the concourse level.
- Aircraft Gates – As airlines continue to replace small regional jets with larger ones and 'full-size' narrowbody commercial aircraft, the need for additional gates is limited. As larger aircraft accommodate more enplanements with the same number of gates, gates positions and holdroom size needs to increase, but the number of gates may not. The master plan identified the need to retain 16 existing gates. However, all gates should be equipped with passenger boarding bridges (PBB) and the ability to accommodate the critical 'passenger' aircraft (i.e., Boeing 737 or Airbus A320 series).
- Outbound Baggage Processing – The existing systems require upgrading to an inline outbound baggage screening system; the current system utilizes separate screening devices for different airlines. Some expansion is needed to improve the layout and function.
- Arrivals Baggage Claim Hall – Additional separation and circulation space is desirable between the claim devices and the rental car counters.
- Baggage Claim Devises - Forecasted passenger growth recommends that a fourth claim device is needed in the long-term period.
- Concessions – Program requirements identified additional need for airside concession as passenger activity grows. Currently, redistribution of food services from the headhouse to the concourses is also recommended.

5.3.3 Short-Term Concepts and Ongoing Projects

The ALB master plan activities include all traditional and required tasks, however, two outside factors changed the sequence of the tasks. First, as the study commenced during the COVID-19 pandemic, and passenger activity initially dropped to near zero, the activity forecasting required a longer duration to complete than anticipated. In 2020, industry expectations for the length of the COVID impact to passenger travel ranged from six months to six years. This delayed the development of the forecasts while the worst of the crisis evolved and potential for a vaccine became more salient. Second, expanded funding from New York State and the FAA became available, and the ACAA focused on competing for new funding opportunities to advance critical development projects

At this time the sequence of the master planning efforts was re-ordered to prioritize identification and development of alternatives to address existing shortfalls of the terminal building. These short-term needs were vetted and advanced into alternatives and recommendations per both current and projected activity levels. In 2023, three facility improvements listed below are each proceeding to project development, all during the course of the master plan study.

- TSA Security Checkpoint (departing passenger processing)
- Concourses A Gates and Departure Lounge
- Outbound Baggage processing (In-Line Baggage System)

TSA Security Checkpoint: Early in the master planning effort (2021) the need to improve and expand the passenger security checkpoint was identified based on existing enplanements levels. Some expansion to the queuing maze space was completed in the past 10 years; however, the overall existing checkpoint configuration was designed and completed in 1997, five years before 9-11 and the subsequent new TSA requirements. Currently, peak passenger queues at the checkpoint back up beyond the queueing maze and down the passenger bridge to the parking garage as depicted in **Figure 5-3**. During holiday periods, passengers are sometimes held on the lower level in the ticketing hall when the concourse level cannot accommodate any additional people.

The checkpoint area needs to accommodate additional security clearance options (i.e., pre-check, and potential others, including Global Entry, NEXUS and CLEAR), meeters and greeters, concessions, while maintaining access to the 3rd floor observation gallery. As such, development concepts to expand the security checkpoint were prepared, with the focus on expanding the area over the terminal curb. The layout must enable the TSA checkpoint to remain in the existing centralized location, with expanded area both pre- and post-security.

Figure 5-3 – Security Checkpoint Queue

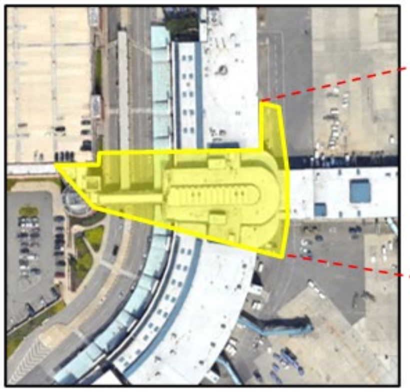
Photo Source: CHA, July 2021

The expansion concepts focused on removing the narrow connector from the terminal to the north parking garage and replace it with a larger functional area that goes well beyond a simple connector. The goal was to expand the area both pre- and post-security with additional space for:

- Passenger queuing maze (pre-security)
- Passenger reconstitution (post-security)
- Screening lanes and equipment
- TSA staffing facilities
- Concessions
- Meeters and greeters
- General circulation

The initial concept included building expansion on both sides of the checkpoint as illustrated in **Figure 5-4**. This concept provides a large area pre-security and retained the checkpoint lanes in their existing location. During the design effort, the plan was refined to move the screening lanes forward (i.e., towards the curbside) to balance the additional space both before and after screening, providing more space for reconstitution, as illustrated in **Figure 5-5**. The refinement also consolidates the building expansion to the area over the curbside resulting in less disruption during construction. Implementation of this project has commenced as of Summer 2023. Renderings of the final plan are depicted in **Figures 5-6** and **5-7**.

Figure 5-4 – Initial Security Checkpoint Concept



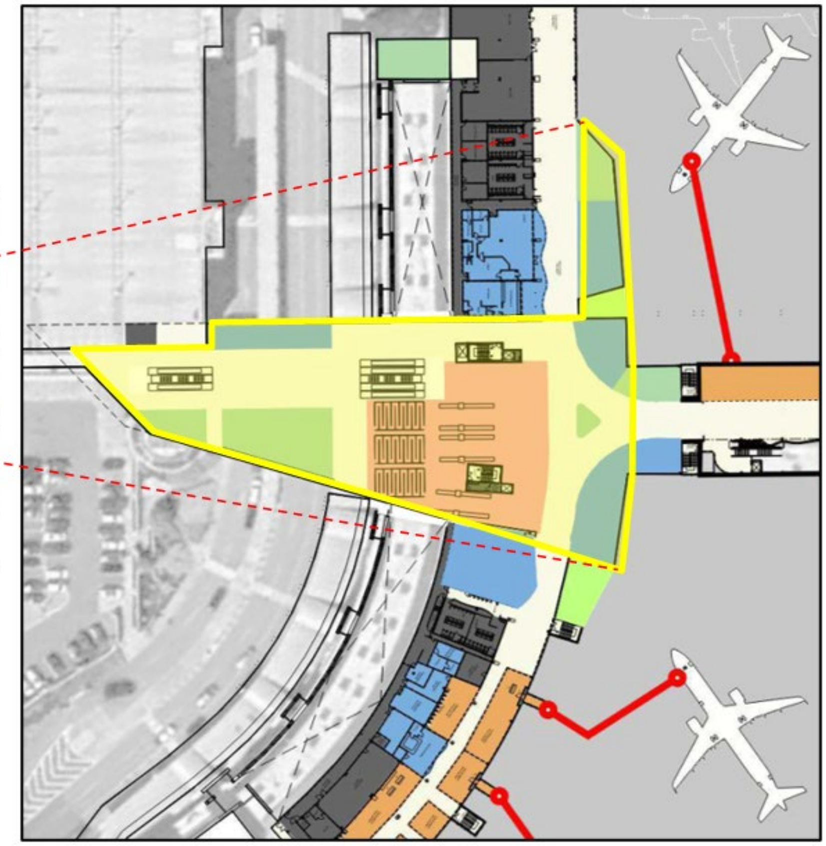


Figure 5-5 – Final Security Checkpoint Concept

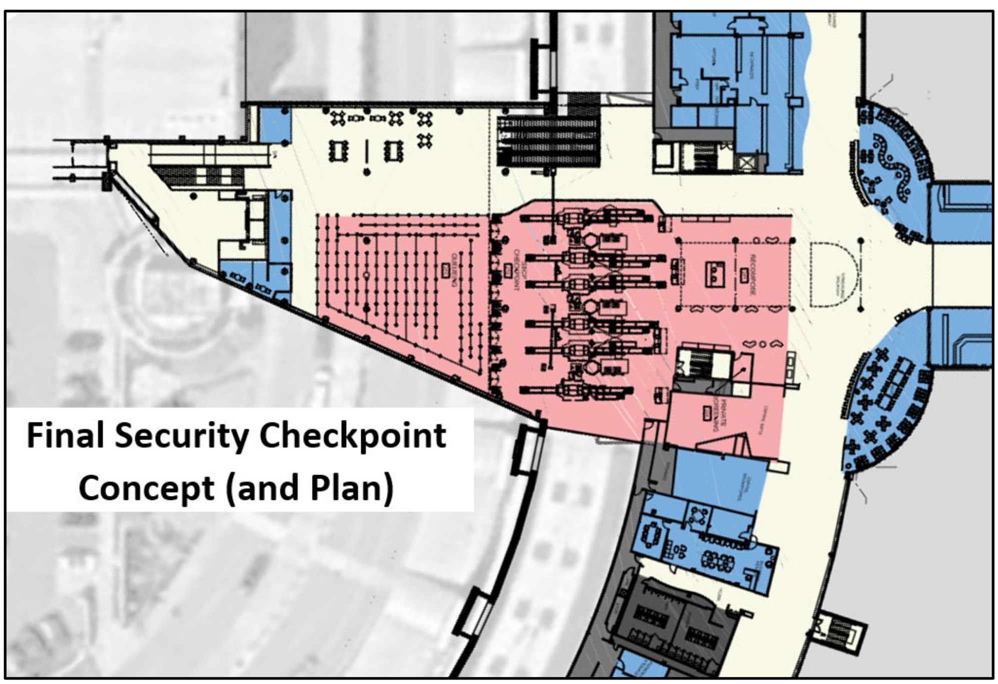


Figure 5-6 – Curbside/Ground-Level Rendering

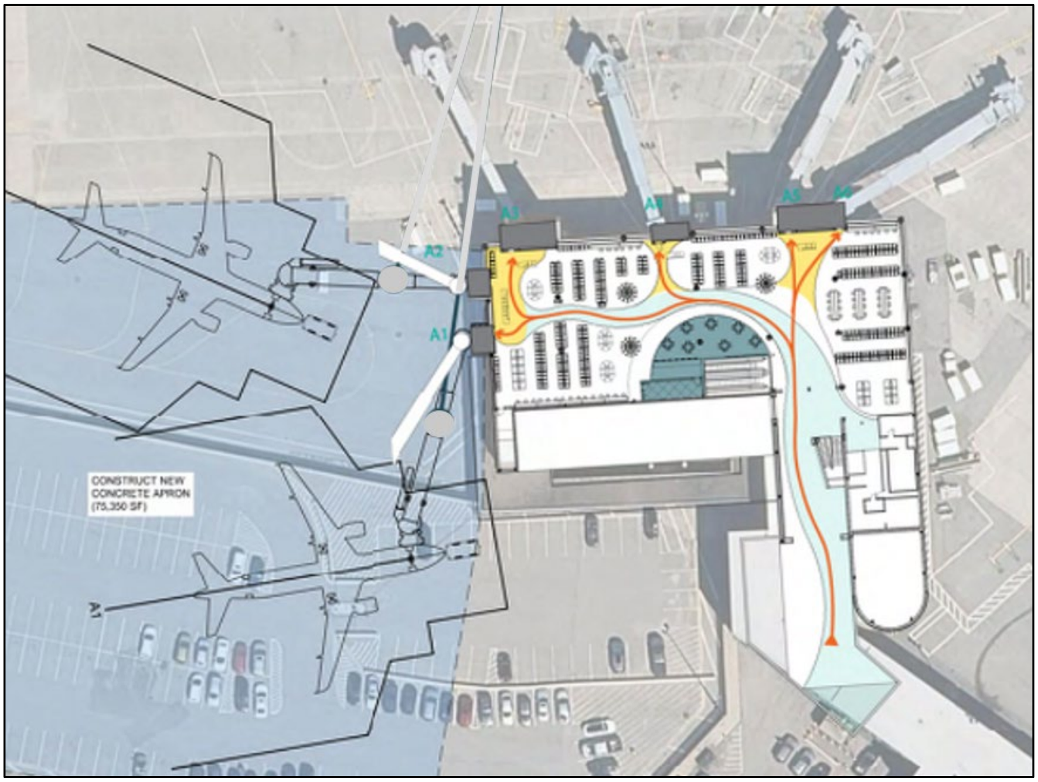
Figure 5-7 – Security Checkpoint – Internal Rendering

Concourse A Improvements (Gates & Departure Lounge): Concourse A is equipped with six gates, including four on the upper concourse level which are equipped with Passenger Boarding Bridges (PBBs), and two gates on the lower (i.e., ground) or apron level. The lower-level gates were used extensively in the past for turboprop aircraft such as the DHC Dash-8 and other propeller-driven aircraft as depicted in **Figure 5-8**. Although the lower-level gates are listed as Gates A1 and A2, they served 10 separate aircraft parking positions, and loaded passengers with movable 'air stairs.'

Figure 5-8 – Concourse A (2003)

Since the airlines have replaced these aircraft with regional jets loaded by PBBs, the lower-level gates are no longer in use. As such, an early Master Plan recommendation included relocating Gates A1 and A2 to the concourse level and adding PBBs to serve narrowbody aircraft as depicted in **Figure 5-9**. Similar to the Security Checkpoint project, this recommendation was advanced during the planning process and will include internal renovations to modernize the Concourse A departure lounge. A key benefit of the project is that it provides two additional functioning gates with PBBs, without expanding the over building size. Additional passenger departure lounge area is increased by approximately 2,000 square feet by adding floor area in the location that is currently open to the lower level. The relocated gates will be sized for up to ADG III aircraft (e.g., Boeing 737) so that they can accommodate all commercial aircraft anticipated to use ALB throughout the planning period. The existing lower-level passenger lounge could be utilized for aircraft diversions, including international diversions as passengers can be segregated in the lower-level for customs clearance when necessary. The two relocated gates will accommodate forecast demand for a total of 16 contact gates throughout the planning period.

Figure 5-9 – Concourse A Improvements



Outbound Baggage System Improvement: A final short-term recommendation that has advanced to the design process is the outbound baggage system. In the years following 9-11, the FAA phased in a requirement to screen checked baggage. This additional security requirement required similar type screening that has been required for carry-on bags for over 50 years. At ALB, the airlines have separately handled check bags, and outbound bags were loaded onto carts in parallel by individual airlines. As the screening requirement came into effect, separate screening devices designated for each airline became an inefficient system.

This project will reconfigure the outbound baggage processor to what is termed as an 'inline' baggage system, where all airlines will use the same baggage conveyor belts and the most current screening systems. This improvement will enhance efficiency and security for the benefit of passengers, airlines and the TSA. The improved system will remain located behind the ticket counters on the ground level of the terminal and is unseen by airline passengers.

5.3.4 Long-Term Development Concepts

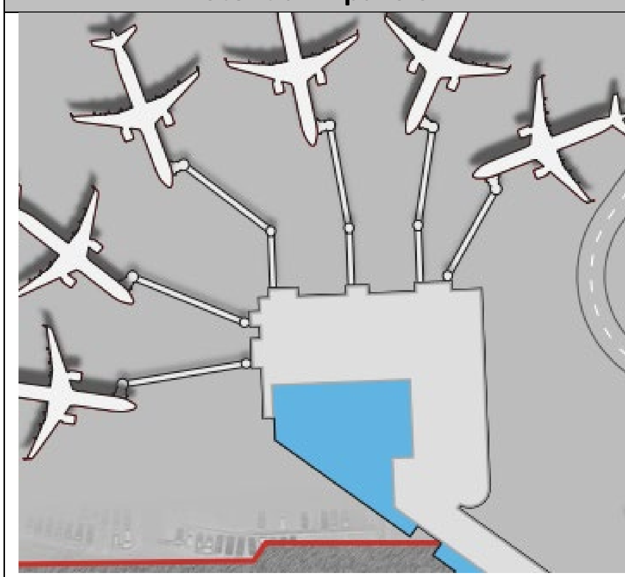
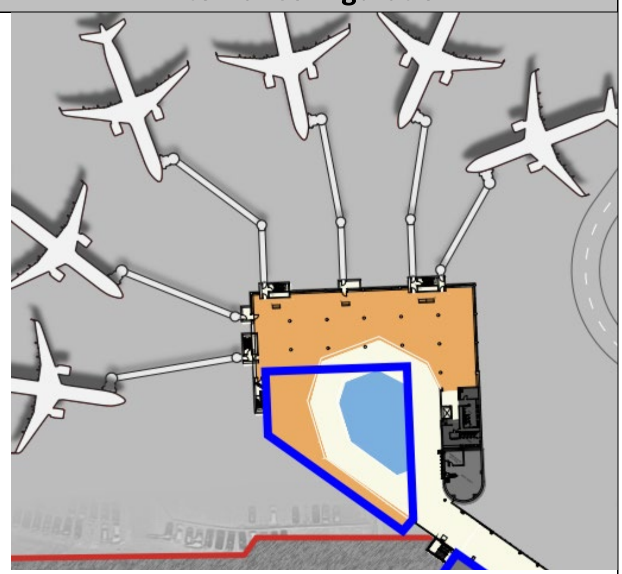
Since the previous major redevelopment of the passenger terminal building in the late 1990's, the ACAA has continuously maintained and renovated the building to satisfy passenger and airline needs. As such, the forecasted growth over the next 20-years will only require incremental improvements and modest expansion of the terminal components and processors. Therefore, the Master Plan's long-term concepts would be implemented if and when demand dictates. Based on the forecasts, additional expansion of the Concourse is not anticipated until after the planning period (+20 years). However, such expansion is evaluated in the Master Plan to ensure that the Airport can accommodate any reasonable growth, demand, and additional airline tenants. Concepts that are identified for beyond the planning period are identified in the discussion below.

Long-term concepts were prepared for the:

- Concourse A, B, and C Improvements: Gates, Holdrooms, and Concessions
- Inbound Baggage Hall and Claim Devices
- Ticketing Hall

Long-Term Concourse A Concepts: The current improvement project that relocates two gates from the ground level to the concourse level includes a small additional area for passenger seating within the existing building footprint. However, if the number of flights using these gates and the size of aircraft increases over time to all narrowbody aircraft (+100 passenger seats), it is anticipated that the overall holdroom area could become congested. To address the potential congestion an expansion of the building could provide an 60% increase in the area available for passenger seating and concessions, from roughly 10,000 to 16,000 square feet.

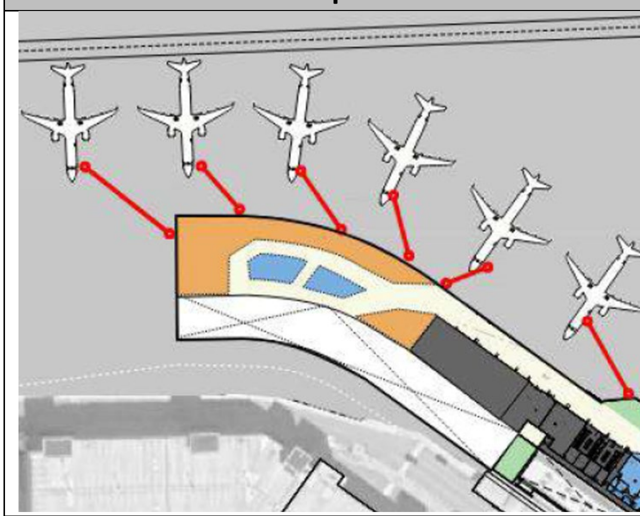
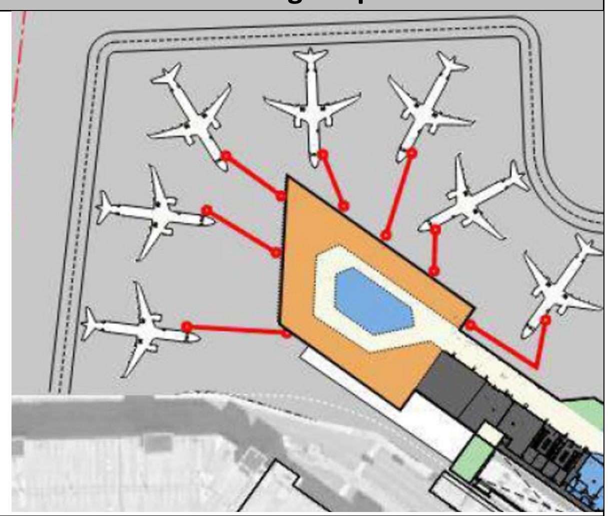
Table 5-7 –Long-Term Concourse A Holdroom Expansion

General Layouts	
Potential Expansion	**Internal Configuration**
	

Two additional concepts for Concourse A were prepared due to the overall age of the building. Although the structure has been well maintained and is in good condition, it is the oldest portion of the terminal building complex and was built 45-years ago. Therefore, it is reasonable to consider the option to replace the building at some point in the future, which could be implemented at some point after the planning period. As such, these concepts are not necessary to accommodate forecast demand. The two additional concepts are described below:

A **Linear Expansion,** where the concourse extends along the existing corridor to the west, with a single-loaded layout stretching towards the end of the existing apron. The overall size of the building would be similar to the simple expansion above, and also provides for six gates (ADG Group III). One advantage over the existing layout is the additional distance from parallel Taxiway C. As previously discussed in the airfield section, this additional distance would enable aircraft pushed-back from the gates to remain clear of Taxiway C Object Free Area (TOFA) and separates apron activity from the movement area of Taxiway C.

Table 5-8 –Long-Term Concourse A Redevelopment Concepts

<table>
<tr><th colspan="2">General Layout</th></tr>
<tr><th>Linear Expansion</th><th>Dwell Lounge Expansion</th></tr>
<tr><td></td><td></td></tr>
</table>

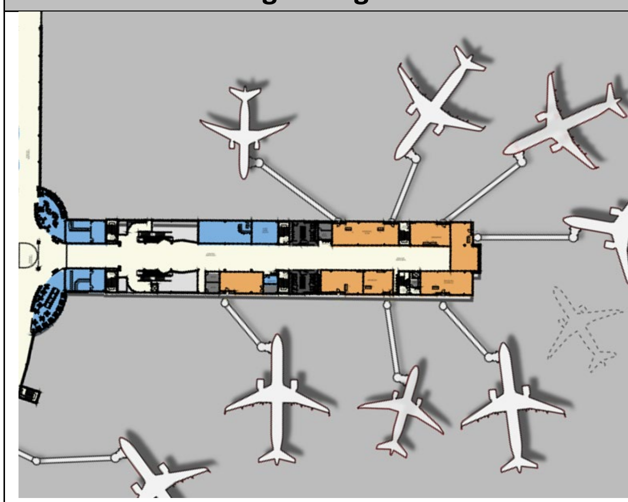
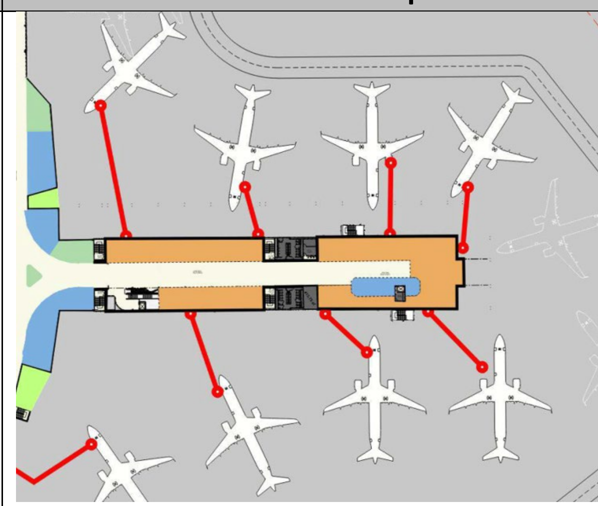
A **Dwell Lounge Expansion** configuration could also be considered with the same benefits as the Linear Expansion. The dwell lounge concept uses a double-loaded layout (i.e., gates on two sides of the building) and a centered concession area. Dwell lounges have become more popular in recent years in concourse design as they tend to provide better visibility to each of the gates. Therefore, passengers may feel more comfortable dwelling in a central concessions area as they wait for their flight to board.

From a cost standpoint, the Linear or Dwell Lounge Expansion concepts would likely require four times the investment as the simple Holdroom Expansion concept for the same number of gates and similar interior space. Therefore, the Holdroom expansion, if necessary, is recommended in the long-term. If a building system evaluation determines that the building structure needs replacement, the Dwell Lounge Expansion should be considered as an alternative plan. It is emphasized again that per the activity forecasts, these long-term concepts are not needed for capacity, and were prepared for planning purposes

Long-Term Concourse B Concepts: The existing concourse provides seven gates, one Remain Overnight (RON) aircraft parking position, and associated holdroom and concession areas. Per the facility requirement evaluation, this is adequate throughout the planning period from a capacity standpoint. However, the evaluation identified a shortcoming in that the inner portion of the concourse is underutilized, and the outer gates experience holdroom congestion and seating shortfalls during peak periods. Concessions are available with the first half of the concourse, but no concessions are provided in the busier outer locations.

To address this limitation a long-term concept was prepared to 'Rebalance' the concourse without any significant expansion. As shown, the concept retains the seven gates, but distributes their location more evenly throughout the concourse. This enables a second RON position (or an additional gate), additional seating capacity, and relocates the concessions to the outer portion of the concourse. A small amount of additional floor area is obtained by moving two internal staircases to an external location, and by eliminating open floor area to the lower level.

Table 5-9 –Long-Term Concourse B Rebalance Concept

Long-Term Concourse B – Rebalance Concept	
Existing Configuration	**Rebalance Concept**
	

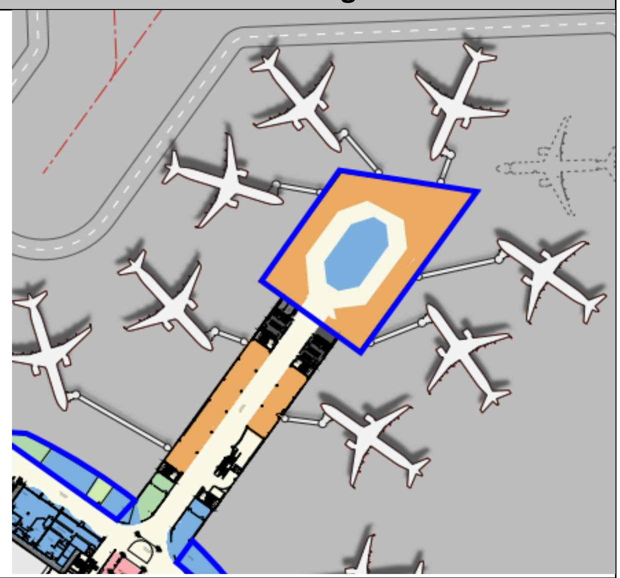
Per the activity forecasts, further expansion beyond the Rebalance Concept is not anticipated; however, an expansion concept was prepared for planning purposes. If activity growth exceeds expectations, this concept could be considered. The Expansion concept includes widening and extending the concourse and providing a dwell lounge with added concessions. The total floor area increase is approximately 25% over current conditions, with provisions for eight or nine gates.

Overall, the Rebalance concept is recommended in the long-term. As it is not based on capacity needs, the timing could be associated with the next renovation or refurbishment of Concourse B. The expansion concept should be reserved in the event passenger growth exceed expectations.

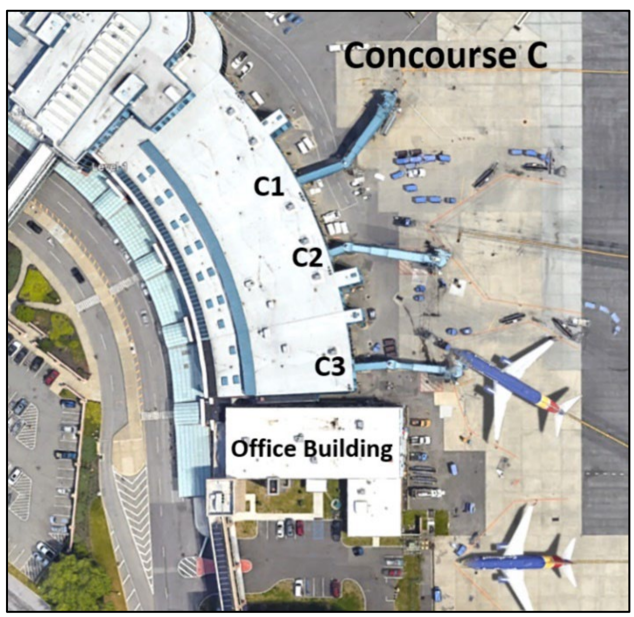
This expansion concept would demolish approximately 10,000 square feet of the concourse and replace it with a new 20,000 square foot holding room with concessions.

Lastly, renumbering the B gates should be considered in the near future. In the 1990’s, Concourse B also used a set of ground level gates without PBB’s for turboprop aircraft. These gates are numbered Gates B1-B4. As the active gates are now Gates B5 through B11 they could be renumbered Gates B1 through B7.

Table 5-10 –Long-Term Concourse B Expansion Concept

Long-Term Concourse B – Expansion Concept	
Potential Expansion	**Internal Configuration**
	

Long-Term Concourse C Concepts: The existing concourse provides three gates with PBBs, holdrooms, and concessions, as well as three RON aircraft parking position situated to the south. On the lower-level is the ticketing hall, adjacent to the curbside passenger drop-off area, and the outbound baggage system.



The concourse is bordered by an older office building immediately adjacent to the southern wall, and is currently leased by CommuteAir and other service providers.

Similar to the other concourses, expansion is not forecasted to be required within the planning period, but options for improvement and extension were considered for long-term planning purposes. The Expansion Concept for Concourse C requires the demolition of the existing office building to enable a linear extension. Concourse expansion to the east has limited potential due to the proximity of parallel Taxiway A and the airspace surfaces of Runway 1/19.

As shown, a small expansion of approximately 180 feet would provide area for an additional contact gate in the location of the first RON position. Thus, aircraft parking capacity is not increased, but additional holdroom area, gates, and concessions would be provided.

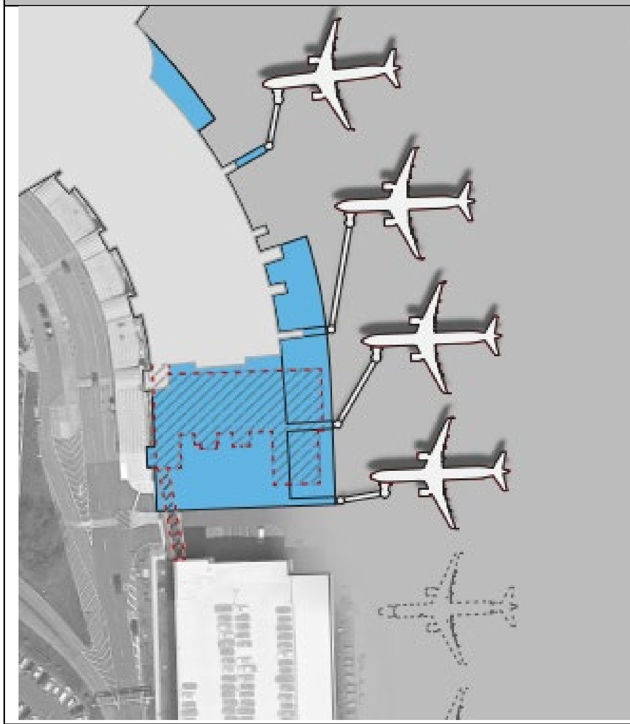
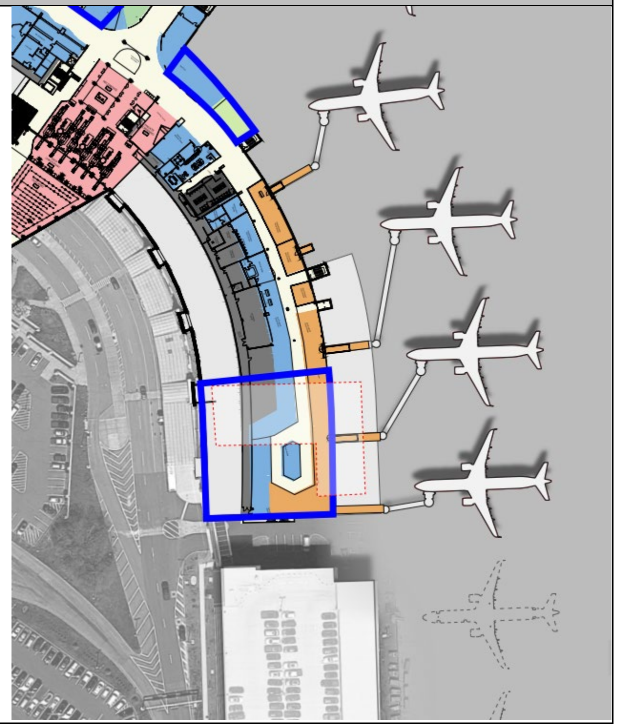
As Concourse C accommodates the existing ticketing hall and outbound baggage, this concept correspondingly provides the potential for expansion for these other processors. As illustrated, expansion for the lower (ground) level outbound baggage may be included towards the south and/or east towards the apron, which can remain flexible based on future requirements. The outbound baggage expansion may include building area may be limited to canopy for weather protection.

This concept enables the following three long-term scenarios:

1. Concourse expansion only: extend the concourse level to the south providing an additional gate and holdroom. The lower-level can remain as a building shell (for miscellaneous storage or other non-public airport use).
2. Ticketing hall and baggage system expansion only: extend the lower-level only. The structure's designed could accommodate the upper concourse level if and when needed. Per the activity forecasts, this scenario is anticipated. The current outbound baggage project includes a small expansion of the lower-level of the building. The area shown below is larger than anticipated and illustrate the maximum potential beyond the planning period.
3. Buildout of both the lower-level and concourse.

All three scenarios require the demolition of the adjacent office building. It is recommended that the long-term plan incorporate Scenario 3.

Table 5-11 –Long-Term Concourse C Expansion Concept

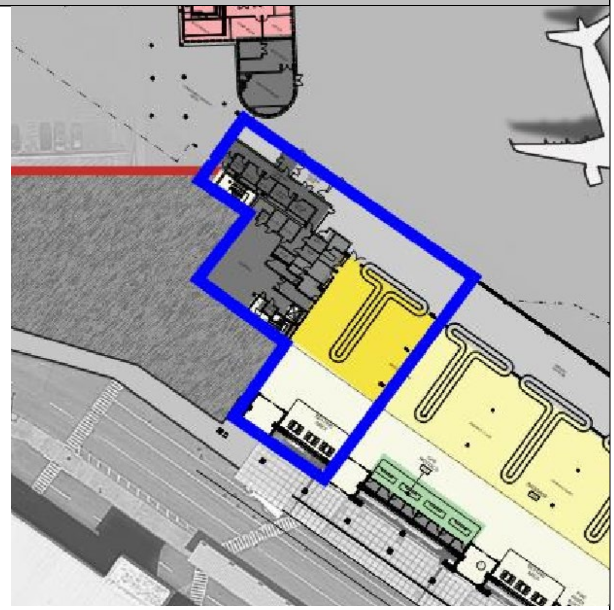
Long-Term Concourse C – Expansion Concept	
Potential Expansion	**Internal Configuration**
	

Ticketing Hall and Outbound Baggage: The description above for Concourse C expansion includes the potential future requirements for these other processors. Beyond the planning period, space is shown for expansion of both ticketing and outbound baggage. Changes in processing methods could alter the anticipated requirements, which should be periodically reviewed.

Inbound Baggage Hall and Claim Devices: The last major passenger processors include the inbound baggage systems and supporting facilities. These items include the baggage claim devices, airline baggage offices, rental car counters, and circulation space. Similar to ticketing and outbound functions, the facility analysis anticipates long-term short falls in these functions towards the end of the planning period.

If necessary, the additional capacity can be accommodated by a simple expansion of the existing building below the elevated connector to Concourse A. As shown, one additional baggage claim device and rental car counter may be provided adjacent to the existing curbside passenger pick-up area. A small outdoor garden would need to be removed or relocated to accommodate this improvement. This is also the location of the terminal building’s loading dock, which may need to be modified as part of this effort.

Table 5-12 –Long-Term Inbound Baggage Concept

Long-Term Inbound Baggage Concept	
Potential Expansion	**Internal Configuration**
	

Overall Terminal Plan: the combined draft recommended plan for the terminal complex includes the following facilities.

Short-term:

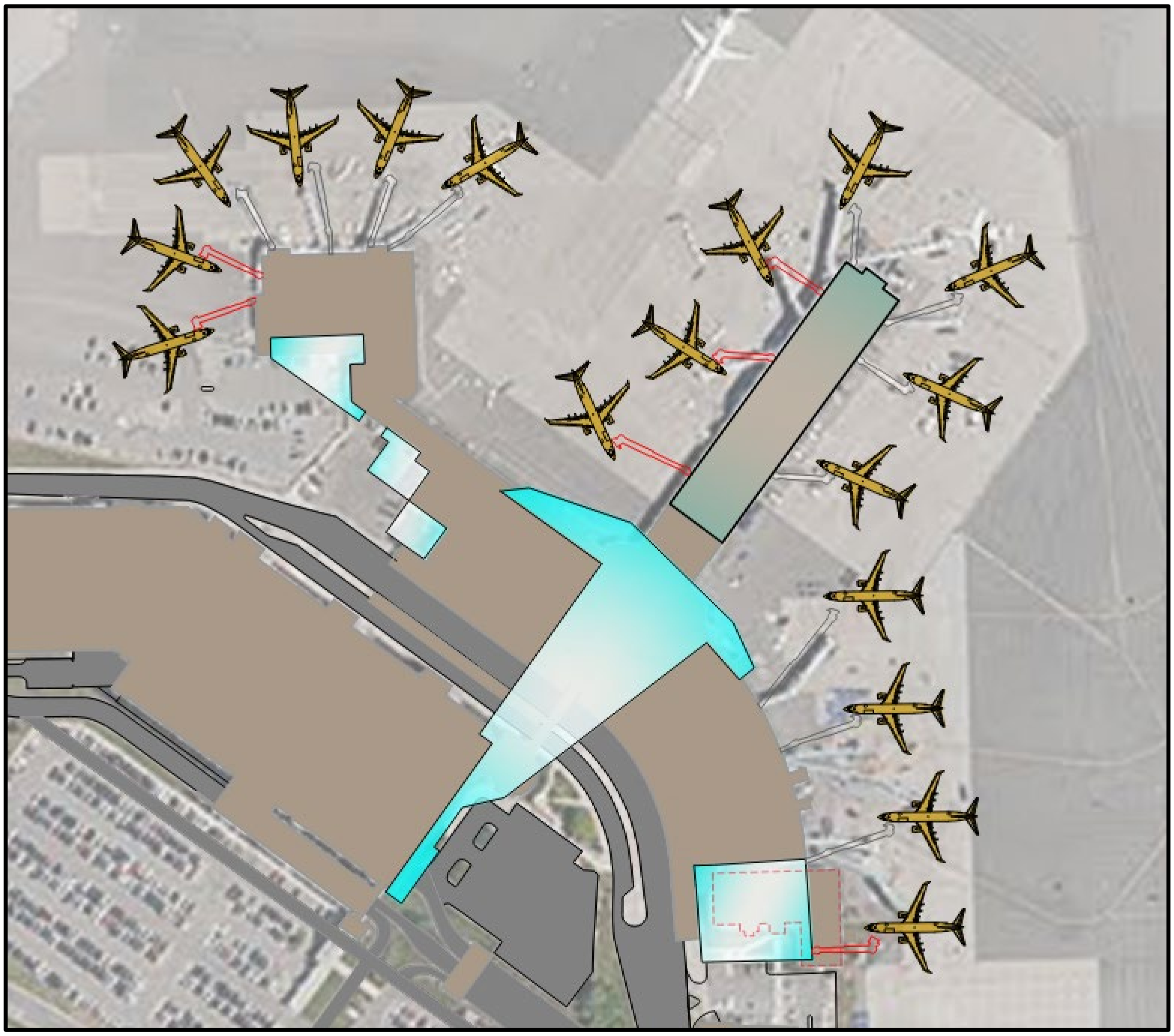
- TSA Security Checkpoint (departing passenger processing)
- Concourses A Gates and Departure Lounge
- Outbound Baggage Processing

Long-term:

- Concourse A – Simple Expansion of holdroom area
- Concourse B – Rebalancing
- Concourse C – Expansion (if needed)
- Ticketing Hall Expansion (if needed)
- Inbound Baggage Hall Expansion (if needed)

As with all long-term facility planning, the Master Plan accommodates all foreseeable needs over the 20-year planning period, but only constructs new facilities as needs are confirmed.

Figure 5-10 – Overall Terminal Plan



5.4 Parking and Roadway Access

Based on the Facility Requirements presented in Chapter 4, both parking and curbside facilities are deficient at ALB. As such, planning alternatives were identified to address each deficiency, including short and long-term passenger vehicle parking, employee parking and rental cars, and terminal curbside limitations. Similar to other components of the Airport, there is limited undeveloped Airport property for expansion of existing facilities, thus the alternatives focus on improved use of current property and redevelopment. The parking and access concepts take a phased approach to address the immediate and future needs of the Airport.

Alternatives and recommendations were identified to address the following existing conditions:

- Passenger parking currently reaches capacity during peak periods.
- Activity growth could result in the need for overflow passenger parking off-airport, if capacity is not increased.

- Rental cars and short-term passenger parking both utilize the first level of the North Garage and have generally reached capacity.
- The employee parking lot is reaching capacity
- Existing surface lots are difficult to expand due to do limited property, as well as environmental constraints (i.e., existing wetlands, streams, and floodplains).
- The terminal curbside experiences congestion during peak periods and has limited ability to expand outward, as well as limited ability to extend linearly
- The main intersection to the passenger terminal includes entering and exiting traffic in a complex layout.

Passenger Terminal Parking Alternatives

Of immediate concern is the need for additional passenger parking to accommodate existing peak periods, with further shortfalls anticipated by the end of PAL 1 (2026). Even with the additional spaces provide by the new South Garage, shortfalls are anticipated. As the terminal area lacks undeveloped space for additional surface lot expansion, the short-term focus is expansion of the Economy Lot. This is not the preferred parking location for passengers due to the required shuttle service and associated additional time required but it is considered the only feasible approach in a critical timeframe.

Short-term expansion of Lot E can provide the additional parking needed to address this issue. Two locations of existing airport property could be considered and can provide up to 1,000 additional parking spaces, as shown in **Figure 5-11** below. Due to locations of wetlands and drainage channels throughout this area, the parking configuration is currently disjointed, and would remain so in the near term. In the long-term, the airport could consider adding closed drainage systems and filling wetland (with appropriate permits and mitigation) to provide an improved parking layout.

Figure 5-11 – Potential Economy Lot E Expansion

However, it is noted that the parking expansion of the Economy Lot would prevent the use of this area for other potential aeronautical developments. As such, the net gain of 1,000 spaces could be significantly reduced if portions of this area are needed for competing aeronautical development.

As the Facility Requirement evaluation, **Section 4.1.1**, identified the need for up to 3,000 additional parking spaces over the planning period, a long-term solution to address parking requirements is needed and may include the addition of a new parking garage. With limited available space, this concept would include converting the long-term surface parking lot adjacent to the North Garage into a new garage (Garage 3), see **Figure 5-12**. This garage would be a new structure but would be connected and integrated to function as an expansion of the North Garage. It is recommended that airport rental cars and QTA facilities be relocated to the first level of the new garage in order to free up parking space for short-term passenger parking in the existing North Garage.

The single-floor square footage of Garage 3 would be approximately 112,000 SF. Assuming 350 SF per car, this garage can accommodate approximately 1,600 parking spaces on five levels or 1,920 parking spaces on six levels. The current long-term lot on this site has 431 parking spaces, therefore the garage would provide a net gain of 1,169 to 1,489 spaces, depending on the number of levels. Adding the expansion of the Economy Lot, the total net gain would be approximately 2,500 additional spaces.

With the relocation of rental cars to Garage 3, a new access route for rental car return would be needed to bring rental cars from the south via Albany Shaker Road. Exits from the parking system could be directed to the north through the existing exit areas adjacent to the North Garage (Exit Plaza North Garage) or to the north through a new traffic flow layout and the addition of a new exit plaza.

Beyond the planning period, the ultimate development of the landside facilities allows for a fourth garage to be built on an existing long-term surface lot to the south (Garage 4). The single-floor square footage of this garage is approximately 118,000 SF, accommodating 1,685 parking spaces on five levels or 2,022 parking spaces on six levels. The current long-term lot on this site has 441 parking spaces, so the garage would provide a net gain of 1,244 to 1,581 spaces. Additional connectors between Garage 3 and/or the South Garage could be considered with this phase.

Although a fourth garage is not anticipated during the planning period, it may also be considered as an alternative if demand arises for alternative aeronautical uses of the Economy Lot. Such a scenario is not anticipated but is presented as a contingence.

It should be noted that further cost-benefit analyses and in-depth parking demand studies would be required in order to move forward with the any large-scale parking garage project. Such a study would consider the potential for the use of Transportation Network Companies (TNC) (i.e. ridesharing services, such as Uber and Lift) if usage were to increase significantly, or if self-driving cars become commonplace in the future. These scenarios would reduce the demand for future parking at ALB.

Terminal Curbside Alternative

The Facility Requirement analysis also determined that the terminal curb experiences congestion during existing peak periods and is forecasted to worsen over time. **Section 4.4.3** describes the existing curb length at approximately 670 linear feet (both public and commercial lanes), with an ultimate need for a length of 1,000 linear feet. With an inability to meaningfully extend the curbside, a potential revised traffic flow was identified that includes creating a new commercial curbside running through the center of the parking area. This addition would serve parking and hotel shuttles, taxis/limos, and TNCs, see **Figure 5-12**. This development could provide a formal Ground Transportation Center (GTC) that would also include mass transit (i.e., buses). The existing commercial lanes at the terminal frontage would then be repurposed for private vehicle use. The additional capacity provide by the new commercial lane would be adequate throughout the planning period.

Access and Traffic Flow

The overall parking and access alternative also contemplates enhanced one-way access flow from southeast to northwest. The existing exit plaza located south of the terminal building would be converted to an entrance plaza to access the expanded parking facilities. Pavement and curbs in this location would be modified for one-way access flow. New exit plazas will be located to the northwest of the parking lots and North Garage, as well as the exit for the new commercial curbside. This integrated concept would achieve a number of goals, including streamlined parking revenue control, improved wayfinding, expanded curbside, and an improved entrance roadway. It is noted that further evaluation and traffic studies are needed to identify the most optimal traffic flow for the Airport.

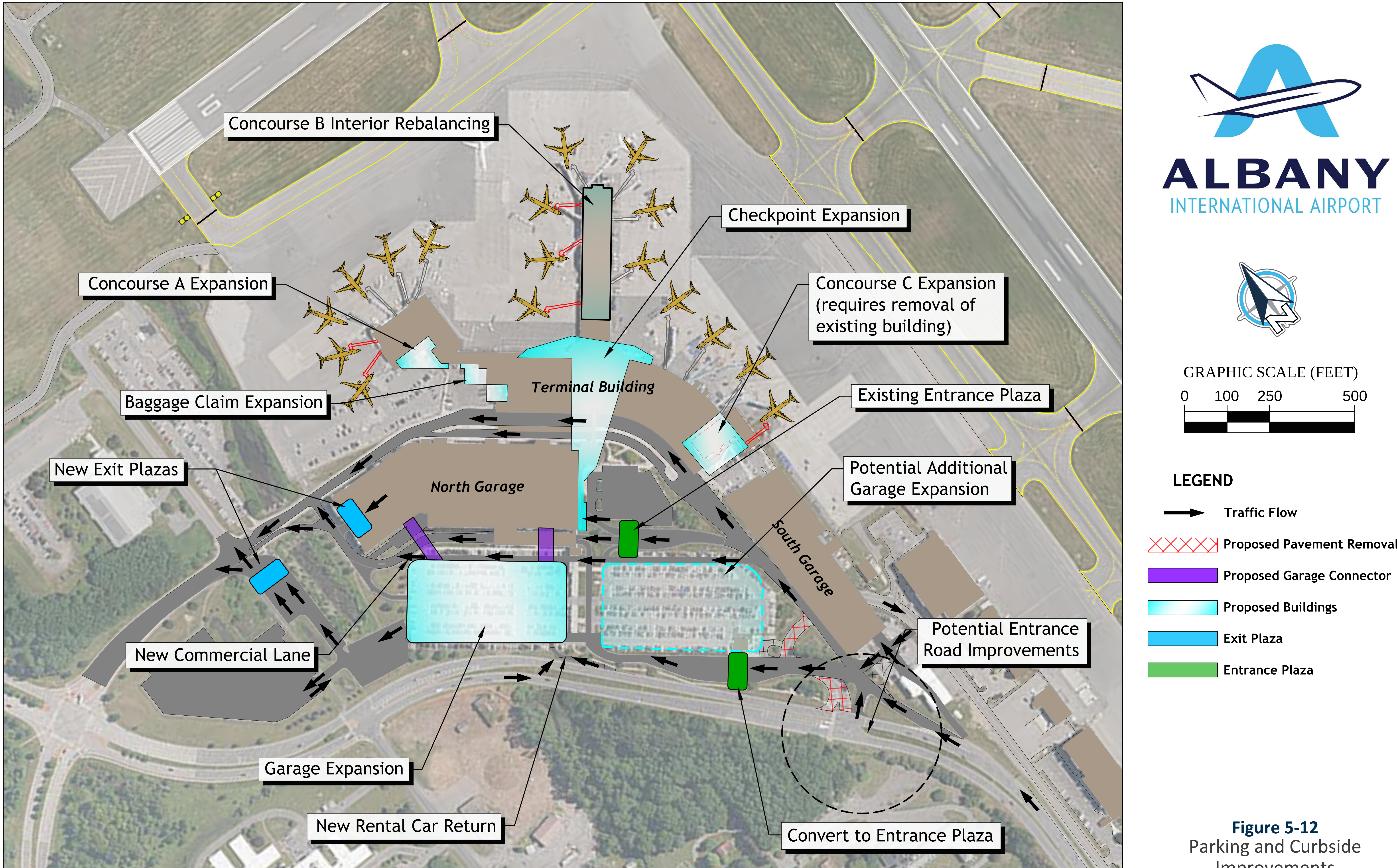
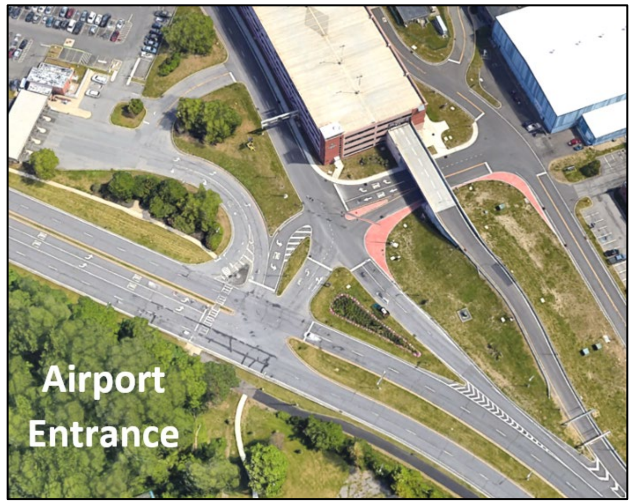


Figure 5-12
Parking and Curbside Improvements

Airport Entrance Considerations



The existing airport entrance is relatively complex with two traffic signals, multiple destination choices (i.e., terminal curb, and long-term, short-term, and garage parking), as well as exiting traffic from the Economy Lot and South Garage. In the short-term, it is recommended to replace or improve the traffic management system equipment (i.e., traffic signalization) to improve overall traffic flow and efficiency.

In the long-term, the improvements advanced for parking and curbside access could also include physical improvements to the airport entrance intersection. Potential improvements could include separate intersections for exiting and entering traffic, roundabouts, or other facilities to improve traffic flow and wayfinding. Any such improvements would also need to address existing and future traffic along Albany Shaker Road. As part of such improvements, a detailed traffic evaluation would be needed, in coordination with Albany County and the Capital Region Transportation Council (CRTC).

Pedestrian and Bicycle Access

In addition to the vehicle access, the Airport Terminal Building and parking facilities include pedestrian access provided via curb-separated paved sidewalks. These existing sidewalks connect the terminal complex to the multi-use path located along Dalessandro Boulevard (County Route 155), which continues south towards Wolf Road. Additional sidewalks connect the terminal building to the multi-use path that parallels Albany Shaker Road (County Route 151), heading north to NYS Route 7. As part of the recommended access road improvement to the Terminal Building, consideration will also be given to adding a bicycle lane and/or upgrading the existing on-airport sidewalks to multi-use paths. The terminal building provides existing covered bike racks, which will be retained or improved.

Note that Dalessandro Boulevard and Albany Shaker Road (County Route 155) are owned by Albany County. Thus, connections must be coordinated as appropriate. Airport sponsored improvements must be limited to on-airport locations per federal regulation; however, the Airport is supportive of additional off-airport bicycle and pedestrian facilities in the vicinity of the Airport that may be advanced by the County or other organizations.

Parking & Access Recommendation Summary

The above evaluation results in the following recommendations for each element of the parking and access systems that best meet user demands. It is again emphasized that additional traffic, feasibility, and cost-benefit analyses would be need before advancing this plan.

- Expand Economy Lot E in the short-term to accommodate peak periods and short-term activity growth.
- Consider a new parking garage in the long-term, integrated with the North Garage, if parking needs continue to grow. Vertical expansion is the only long-term viable option since there is no available locations for additional surface lots on existing airport property.
- If a new garage is developed, relocate the rental cars to the first floor of the new garage. This will enable expansion of the short-term passenger parking.
- For expanded employee parking, repurpose a portion of the west side long-term/overflow lot. This would retain employee parking in the same general vicinity as the current location. Separately, there is the potential to expand the Capital District Transportation Authority (CDTA) bus services to the Airport that could alleviate the need for additional employee parking.
- Convert the existing commercial vehicle curb lanes for additional capacity for private vehicles.
- Develop a separate commercial curbside, with a new GTC.
- Develop a one-way traffic flow. Curbside and parking would enter the terminal complex from the south, with new exit plazas to the north.

- Complete Traffic Management System enhancements at the airport entrance, with potential intersection improvements in the long-term.
- Improve bicycle and pedestrian facilities on the airport between the terminal curbside and the existing Multi-Use Paths on Albany Shaker Road / Delassandro Boulevard.

5.5 General Aviation Facilities Alternatives

General Aviation (GA) activity at ALB represents approximately one-third of total annual airport operations and includes various types of private, corporate, and business aircraft flights. GA services and facilities are accommodated by Million Air, which is located in the Southwest Quadrant of the airfield and currently the Airport's only Fixed Based Operator (FBO). Additional GA facilities include four T-hangars in the Southeast Quadrant and three corporate hangars in the Northwest Quadrant. The identified future hangar requirement (aircraft storage bay area only) includes a minimum of 60,000 SF of additional corporate hangar space for large corporate aircraft over the course of the planning period. However, this does not include itinerant aircraft or new based aircraft beyond the forecasts, or tenants that would upgrade from apron tiedown, or upgrade to a private hangar (i.e., in lieu of a shared space in an FBO hangar. Throughout the Northeast there is a shortage of hangar space for large corporate jets and airports have found that demand can be stimulated merely by having available hangar space for corporate jets. Thus, for planning purposes an area of up to 200,000 SF of hangar space should be reserved as part of the alternative planning. Thus, similar to the terminal planning, the general aviation alternatives intentionally plan for facilities above the documented demand. This ensures that potential needs beyond the planning period can be effectively accommodated at the Airport.

In discussions with the FBO and Airport Staff, the following GA alternatives were developed and confined to the Southwest and Southeast Quadrants of the Airport as the only sizable areas on the airport with available space for additional facilities. Note that the concepts on the southeast side of the airport were developed with the presumed construction of the east side full parallel taxiway discussed above.

General Aviation FBO Site Expansion

The FBO activity is consolidated within the Southwest Quadrant of the airport. Currently, there is only one location not occupied by a building that is predominantly used for parking itinerant aircraft. This alternative, as depicted in **Figure 5-13**, proposes constructing a 50,000 square foot hangar with additional office space in that area as hangar storage is more desirable due to the Northeast's seasons and weather. The existing availability of all supporting facilities will reduce the total development costs at this size, and improves development feasibility.

Table 5-13 –GA FBO Site Expansion Summary

GA FBO Site Expansion	
Construct additional 50,000 SF Hangar adjacent to existing FBO facilities in the Southwest Quadrant	
Opportunities	**Constraints**
✈ No additional impervious surfaces ✈ Adjacent to existing FBO facilities ✈ Utilities, apron and taxiway area provided ✈ Ground access is provided by Jetway Drive ✈ Lower development costs compared to other locations	✈ Reduces area available for itinerant aircraft parking ✈ May lead to apron congestion during summer busy periods

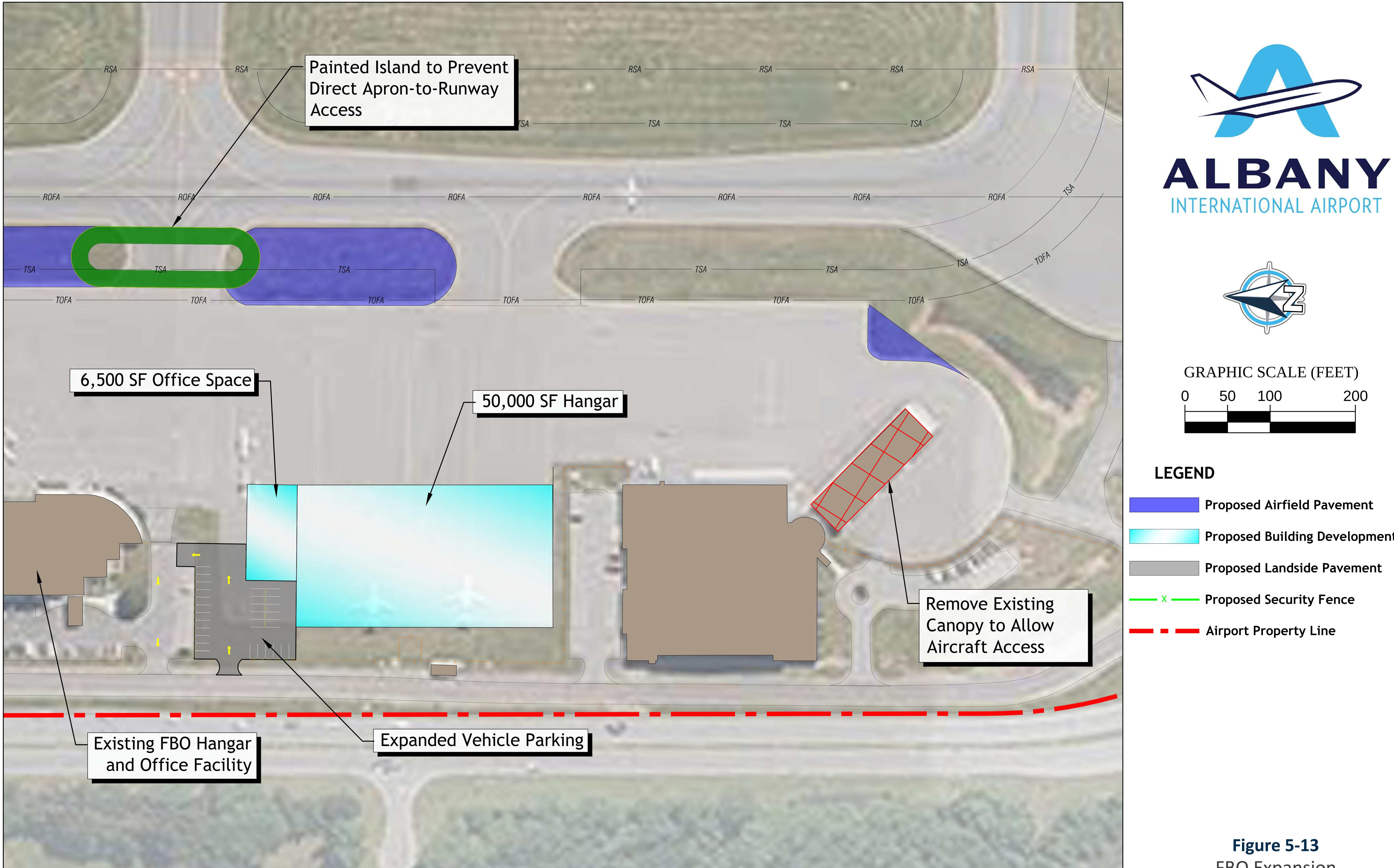


Figure 5-13
FBO Expansion

General Aviation Greenfield Site – Alternative 1

The Greenfield Site Alternative 1 (**Figure 5-14**) depicts an option to accommodate the forecasted aircraft storage demand throughout the planning period. The development utilizes the areas north and south of the existing Taxiway 'D' while providing space for up to 200,000 square foot of hangar space with 520,000 square foot of taxilane and apron space for aircraft movement and staging. T-Hangar 'D' will be relocated to the east, in line with the three other T-Hangars on property recently purchased by the Airport (pending survey of a historic cemetery in that location), or to the north of Taxiway 'D'. The existing pavement from T-Hangar 'D' would be converted to vehicle parking serving the corporate hangars. Additionally, relocation of the Automated Surface Observing System (ASOS) would be required to a location north of Runway 10/28 that meets the FAA siting criteria. For this concept, an ATCT line-of-sight review was completed to ensure the development would not hinder the controllers' view of the airfield or Runway 1 approach.

Access to this location is currently provided by an access road connecting to Old Niskayuna Road to the east. The current airport property footprint, in conjunction with this alternative layout, would render portions of on-airport property inaccessible to aircraft. As such, an area reserved for compatible non-aeronautical development is depicted in the figure, along with a new vehicle access road. As mentioned earlier, this layout presumes development of the east side full parallel taxiway, but such development is not a prerequisite as the alternative may be advanced independently due to the capability to connect into existing Taxiway C and Taxiway D.

Table 5-14 –GA Greenfield Site Alternative 1 Summary

GA Greenfield Site – Alternative 1	
Develop Southeast quadrant of the airport for up to 200,000 feet for corporate hangar space	
Opportunities	**Constraints**
✈ Site size can easily accommodate developments ✈ Sufficient aircraft storage for long-term demand ✈ Independent of Eastside Parallel Taxiway Alternative ✈ Existing public access infrastructure within airport property	✈ Requires relocation of ASOS ✈ Requires relocation of T-Hangar D ✈ May required relocation of VOR for full build out

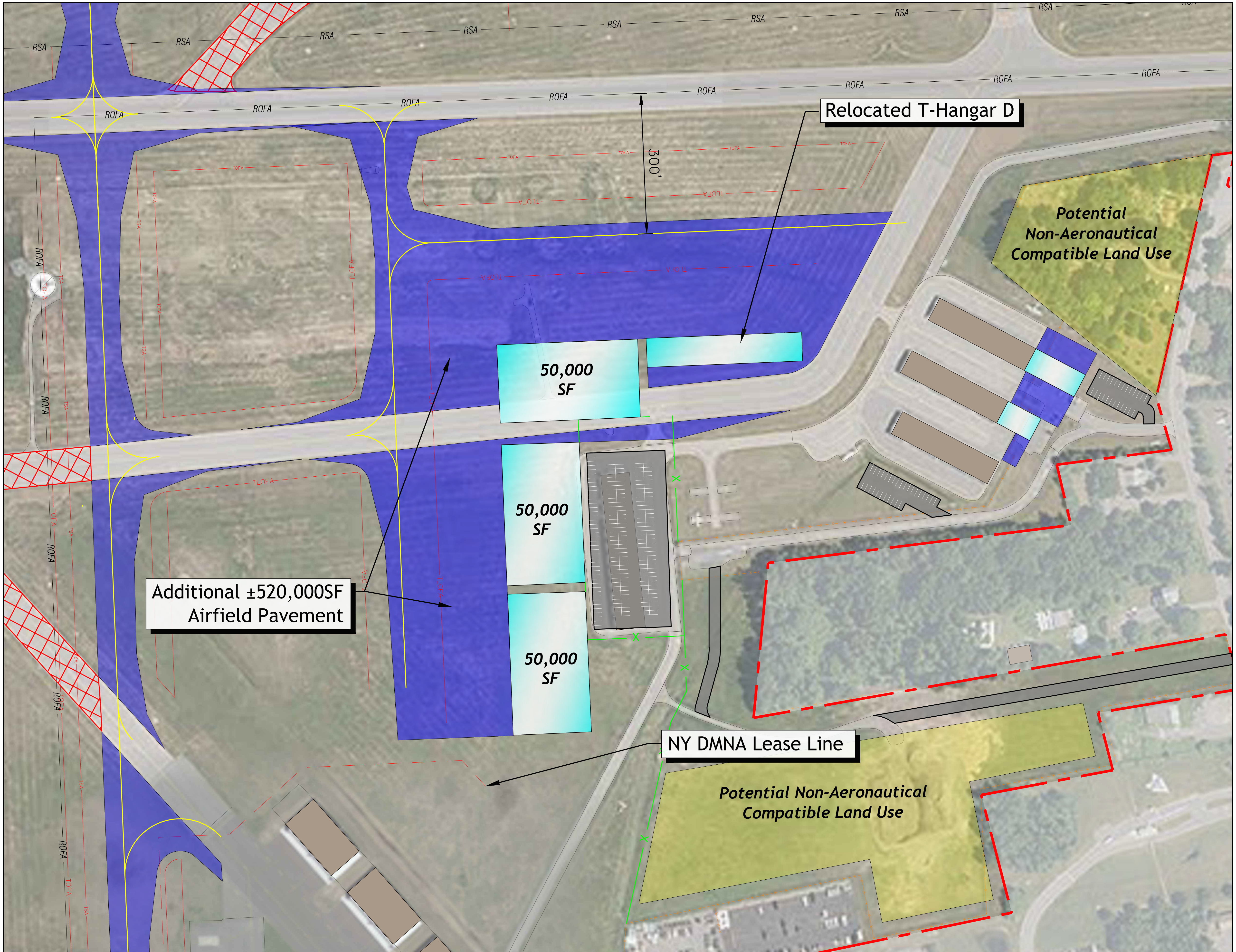
General Aviation Greenfield Site – Alternative 2

The Greenfield Site Alternative 2 (**Figure 5-15**) expands on Alternative 1 and maximizes the potential developable area. As such, the four 50,000 square foot hangars are shifted towards the west, providing space for an additional 50,000 square foot hangar and bringing the total additional apron space to approximately 580,000 square feet. The maximization of space creates inaccessible areas of the airport property by aircraft. As such, an area is reserved for compatible non-aeronautical land use. This allows for more utilization of land compared to Alternative 1 as Alternative 2 minimizes the amount of unused space between the apron and proposed Eastside Taxiway, without impacting Runway 1/19 Part 77 obstruction surfaces or the ATCT line-of-sight.

Similar to the Greenfield Site Alternative 1, a relocation of the T-Hangar 'D' and the ASOS will be required.

Table 5-15 –GA Greenfield Site Alternative 2 Summary

GA Greenfield Site Alternative 2	
Full build out for this location, with additional hangars, apron, and parking	
Opportunities	**Constraints**
✈ Large area for development ✈ Sufficient aircraft storage for long-term demand ✈ Independent of Eastside Parallel Taxiway Alternative ✈ Existing public access infrastructure within airport property	✈ Requires relocation of ASOS ✈ Requires relocation/removal of VOR ✈ Requires relocation of T-Hangar D



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GRAPHIC SCALE (FEET)

0 100 200 400

LEGEND

- Proposed Airfield Pavement
- Proposed Landside Pavement
- Proposed Pavement Removal
- Proposed Security Fence
- Potential Non-Aeronautical Development Area
- Airport Property Line

Figure 5-14
Corporate GA Development
Alternative 1

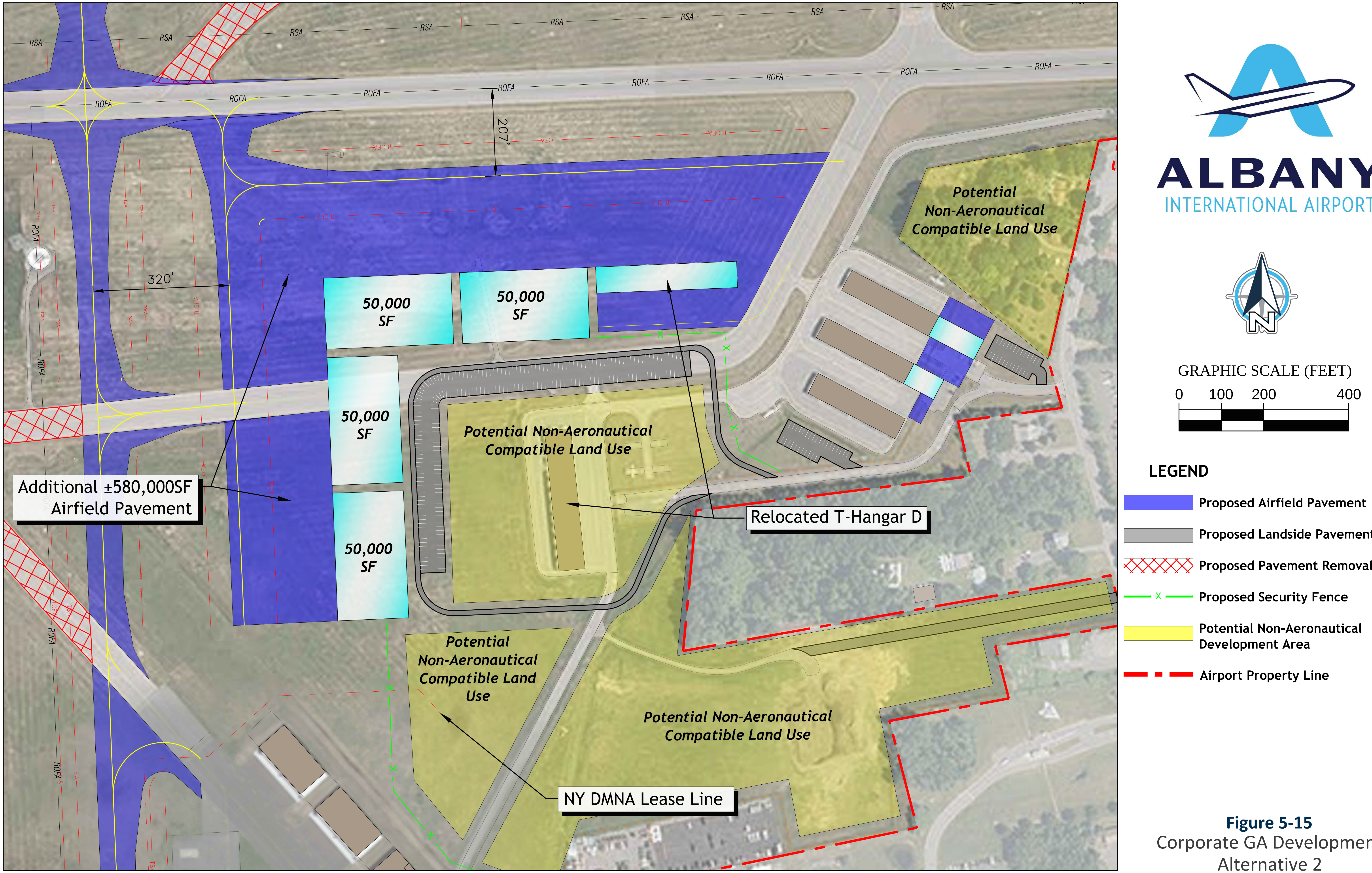


Figure 5-15
Corporate GA Development
Alternative 2

General Aviation E-Lot Redevelopment – Alternative 1

The E-Lot Redevelopment Alternative 1 (**Figure 5-16**) depicts an option to redevelop the overflow portions of the current E-Lot parking facility for corporate GA use. This option aims to maximize the buildout footprint with three 50,000 square foot corporate hangars and three 10-bay T-Hangars. Additionally, 660,000 square feet of apron space is provided for aircraft movement and itinerant aircraft parking during peak periods of the year. In order to recapture the E-Lot parking spaces removed for GA development, the figure depicts vehicle parking expansion towards the east in the existing rental car overflow storage area. Unlike the Greenfield Site alternatives, the E-Lot Redevelopment would require a partial parallel connecting to the Runway 1 end to the southwest and Taxiway 'G' to the northwest.

This maximized aeronautical layout would result in a net loss of approximately 200 vehicle parking spaces in the Economy Lot. Access to this area would be provided via Watervliet Shaker Road towards the east. The Airport previously had an access point to the Economy Lot located on this road. However, it has not been in use since 2020.

It is important to note that portions of this area contain federal wetlands and areas subject to flooding; an environmental assessment and permitting will be required prior to advancing construction.

Table 5-16 –GA E-Lot Redevelopment Alternative 1 Summary

GA E-Lot Redevelopment Alternative 1	
Provide a large general aviation development area, with options for hangars types and substantial additional apron area for itinerant or based aircraft	
Opportunities	**Constraints**
✈ Sufficient aircraft storage and itinerant parking for long-term demand ✈ Large area for development ✈ Existing public access infrastructure within airport property	✈ Wetlands are present on site ✈ Site has stormwater drainage challenges ✈ Requires construction of partial parallel taxiway ✈ Requires relocation of portions for the E-Lot. ✈ Net loss of vehicle parking spaces in the relocated E-Lot

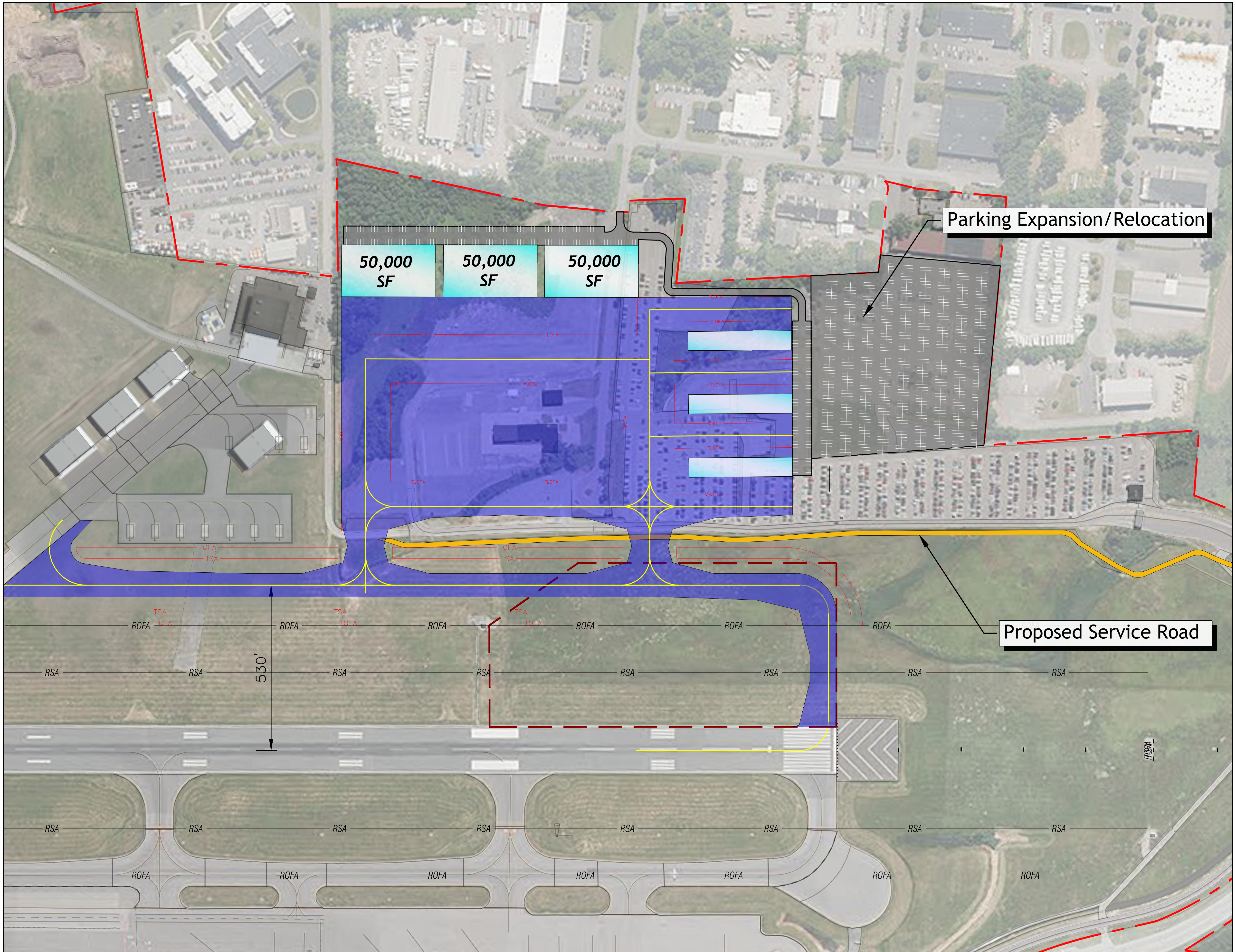
General Aviation E-Lot Redevelopment – Alternative 2

The E-Lot Redevelopment Alternative 2 (**Figure 5-17**) depicts a scaled down version of the previous alternative. This layout prioritizes large corporate and business jet activity with three 50,000 square foot hangars and 410,000 square feet of apron space for aircraft staging and itinerant aircraft parking. With this smaller redevelopment layout, environmental impacts to the wetlands are reduced, as well as additional impervious pavement, particularly in the northeastern portion.

Similar to the E-Lot Alternative 1, portions of the E-Lot will need to be relocated. However, in this alternative, due to the smaller footprint of the aeronautical use areas, the E-Lot may have a net gain of approximately 560 vehicle parking spaces. This concept also provides approximately five acres for non-aeronautical airport development. However, further coordination with the FAA would be required for review and approval of the proposed non-aeronautical development areas if this option is pursued.

Table 5-17 –GA E-Lot Redevelopment Alternative 2 Summary

GA E-Lot Redevelopment Alternative 2	
Provide a large general aviation / corporate development area, substantial additional apron area for itinerant or based aircraft	
Opportunities	**Constraints**
✈ Sufficient aircraft storage and itinerant parking for long-term demand ✈ Large area for development ✈ Existing public access infrastructure within airport property ✈ Net gain of vehicle parking spaces in the relocated E-Lot ✈ Five acres for non-aeronautical development	✈ Located on wetlands ✈ Requires partial parallel taxiway ✈ Requires relocation of portions for the E-Lot.



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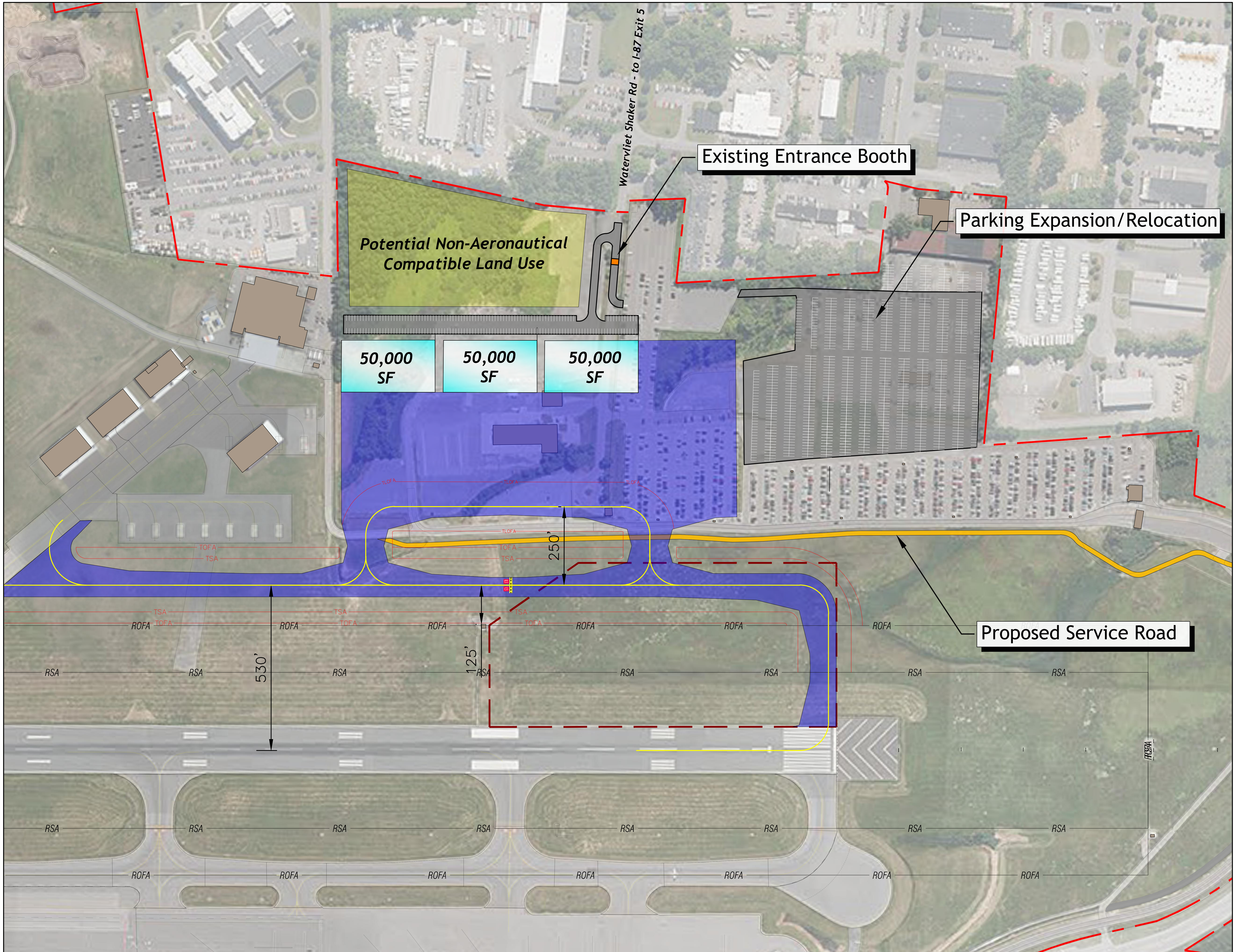
GRAPHIC SCALE (FEET)
0 150 300 600

LEGEND

- Proposed Airfield Pavement
- Proposed Landside Pavement
- Proposed Service Road Extension
- Airport Property Line

Figure 5-16
E-Lot Reconfiguration
Alternative 1



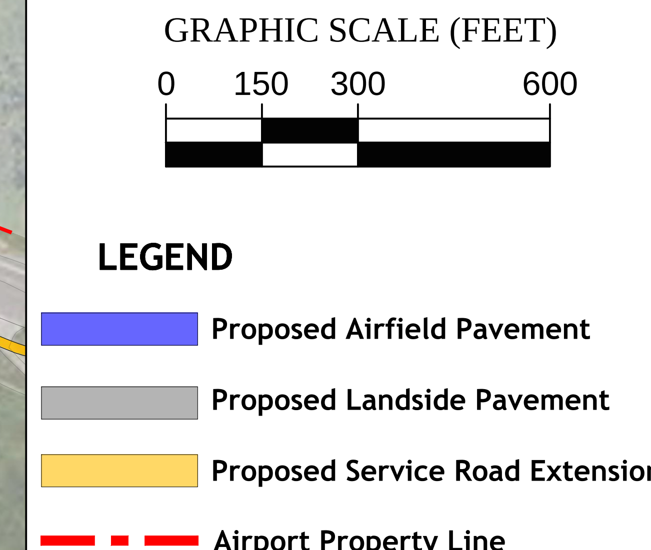


Figure 5-17
E-Lot Reconfiguration
Alternative 2

5.6 Maintenance, Repair, and Overhaul (MRO) Facilities Alternatives

As mentioned in **Chapter 4**, the two MRO operators at ALB are expecting to grow their operations with their current fleet mix of regional jets (e.g. Embraer 145), and ultimately likely to upgauge to larger C-III narrowbody jets (e.g. Embraer 175) in the second half of the planning period, replacing the current regional jets. The larger tail heights of the EMB 175 would prevent the use of the existing MRO hangars at the airport. Thus, new maintenance hangar would be needed; the existing hangars could be repurposed for corporate/GA use. As such, all proposed hangar locations are located to allow for a taller 45-foot building height based on the Building Restriction Line (BRL) set by the Part 77 Transitional Surface. The following alternatives were developed to accommodate the growth in the short- and long-term outlook of the MRO operators and to consolidate MRO operations and promote better land use practices.

MRO Alternative 1

The MRO Alternative 1 (**Figure 5-18**) depicts a simple expansion of the MRO area. This options includes constructing an additional 40,000 square foot hangar, to the southwest, as well as additional large apron space for staging and parking aircraft. The proposed developments may infringe into the Sicker Road town right-of-way . The current airport security fence would need to be relocated. Additionally, the cul-de-sac of Sicker Road, and vehicle access and parking would need to be reconfigured to recapture this area for apron use. The cul-de-sac and parking could be relocated further to the North.

The location of the proposed hangar would require relocation of an existing storage building that is owned by the Airport and leased to an existing tenant. An additional taxiway connector to Taxiway 'A' is proposed to allow for more efficient movement of aircraft in and out of the MRO facilities.

Table 5-18 –MRO Alternative 1 Summary

MRO Alternative 1	
A simple expansion of the Northwest MRO area. This options includes one additional aircraft hangar, and a sizable increase in apron area	
Opportunities	**Constraints**
✈ Sufficient aircraft maintenance facilities for short term demand ✈ Provides new hangar for EMB 175 maintenance ✈ Large increase in apron area for aircraft storage ✈ Located entirely within existing airport property ✈ Provides access to Taxiway 'A' ✈ Utilizes existing Sicker Road for access. ✈ Development is outside of FAR Part 77 surfaces	✈ Requires modifications to Sicker Road and Parking. ✈ Requires relocation of a current building, fencing and parking ✈ Small impact to the Sicker Road Right-of-Way

MRO Alternative 2

The MRO Alternative 2 (**Figure 5-19**) is an expansion of Alternative 1, providing up to three 40,000 SF hangars for as infill in this location. The depicted layout can accommodate EMB 175 aircraft operated by multiply MRO providers. This layout includes additional aircraft apron staging and parking locations as well as easier ingress and egress of aircraft into the new hangars. However, this concept would remove the existing hangars, thus preventing repurposing for corporate use.

Table 5-19 –MRO Alternative 2 Summary

MRO Alternative 2	
Expansion of the Northwest MRO area. This options includes three additional aircraft hangars, and a sizable increase in apron area, and removal of five buildings.	
Opportunities	**Constraints**
✈ Sufficient aircraft maintenance facilities for long-term demand ✈ Reconfigures apron for more efficient aircraft access, with large increase in space ✈ Located entirely within existing airport property ✈ Provides new hangars for EMB 175 maintenance ✈ Provides access to Taxiway 'A' ✈ Utilizes existing Sicker Road for access. ✈ Development is outside of FAR Part 77 surfaces	✈ Requires relocation of a three existing industrial building, fencing and parking ✈ Small impact to the Sicker Road Right-of-Way Requires demolition of existing hangars.

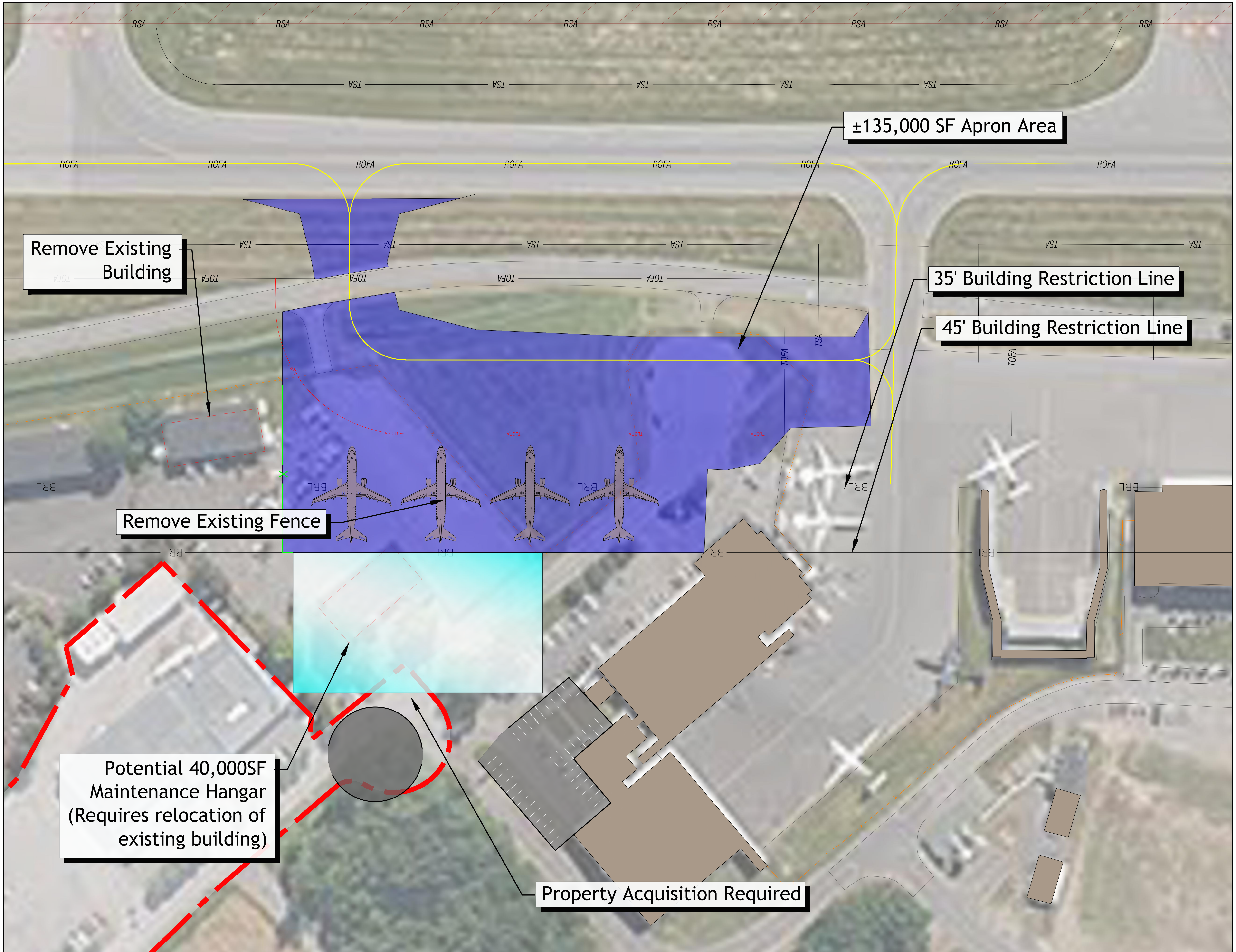


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Figure 5-18
MRO Expansion Alternative 1

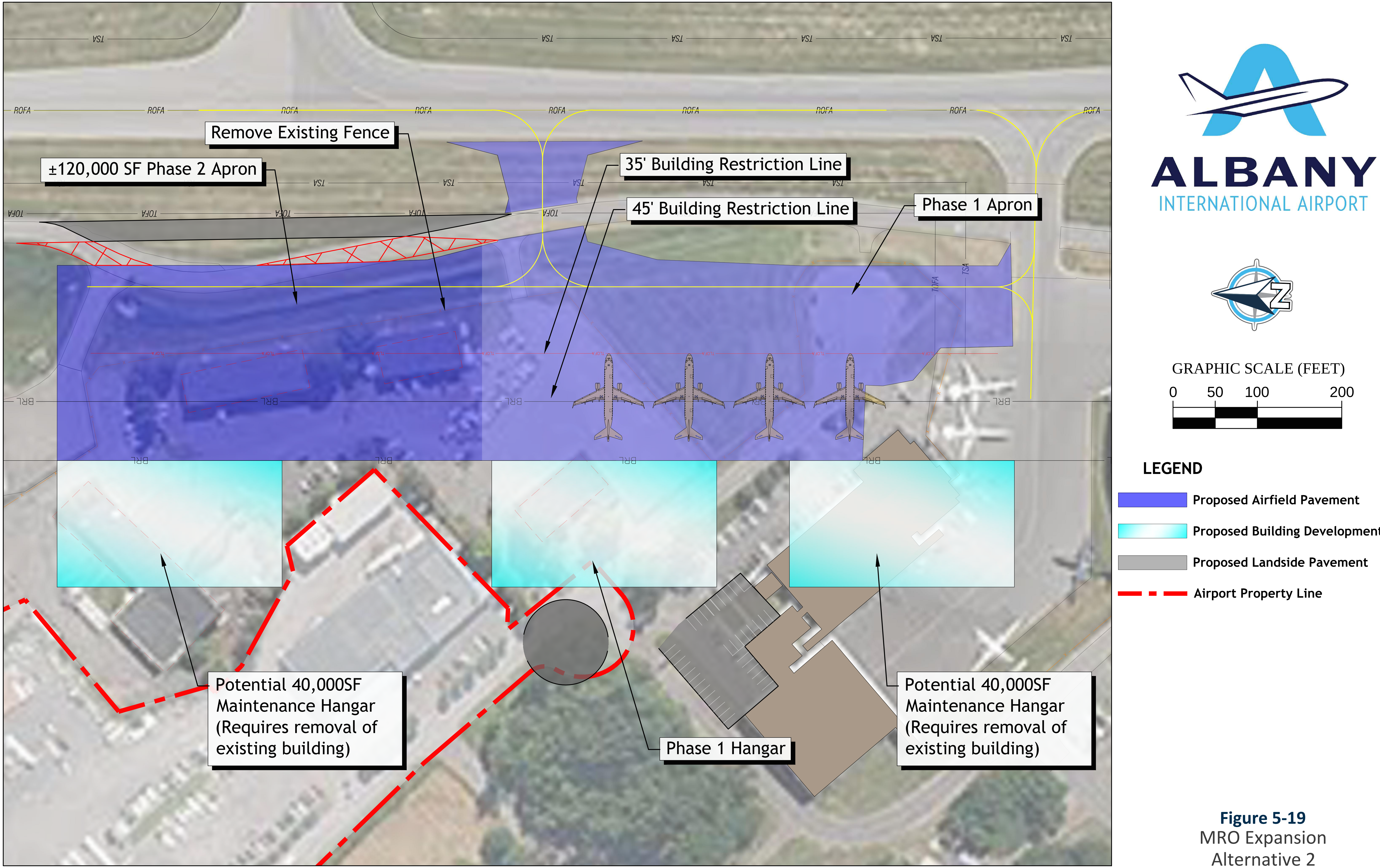


Figure 5-19
MRO Expansion
Alternative 2

5.7 Air Cargo Facilities Alternative

As discussed in **Chapter 4**, the current cargo facilities are not at maximum capacity, with unused parking positions and room for additional aircraft. The cargo building and vehicle parking are nearing capacity and could not accommodate a new cargo operator. As such, one Air Cargo Alternative (**Figure 5-20**) was developed and depicts expansion for an additional operator by providing a 30,000 square foot northern extension of the existing 70,000 square foot sorting facility. The footprint of the proposed facility requires relocation of the existing landside cargo staging area. As such, additional pavement will be extended to align with the northern edge of the existing apron. Portions of the proposed development are located in an area approximately 10 feet lower in elevation relative to the cargo apron, encompassing an area of approximately one acre. This area will require fill to raise the building up to the existing grade.

The site permits operation of a new cargo entrant that operates widebody and narrowbody aircraft. Non-aeronautical development is proposed on the undeveloped eastern side as this cargo development layout will restrict aircraft access to that area. Similar to the proposed GA development layouts, further coordination with the FAA would be required for review and approval of the proposed non-aeronautical development areas if this option is pursued.

Table 5-20 –Air Cargo Alternative Summary

Air Cargo Alternative	
Addition of building and operations space on the north side of the existing facility. Building and staging area would be provided.	
Opportunities	**Constraints**
✈ Accommodates an additional cargo operator, with 2 to 4 additional aircraft, up to a Boeing 767 ✈ Apron expansion not required	✈ Requires large amount of fill to level the development area ✈ Blocks additional future aeronautical development in the greenfield area to the east

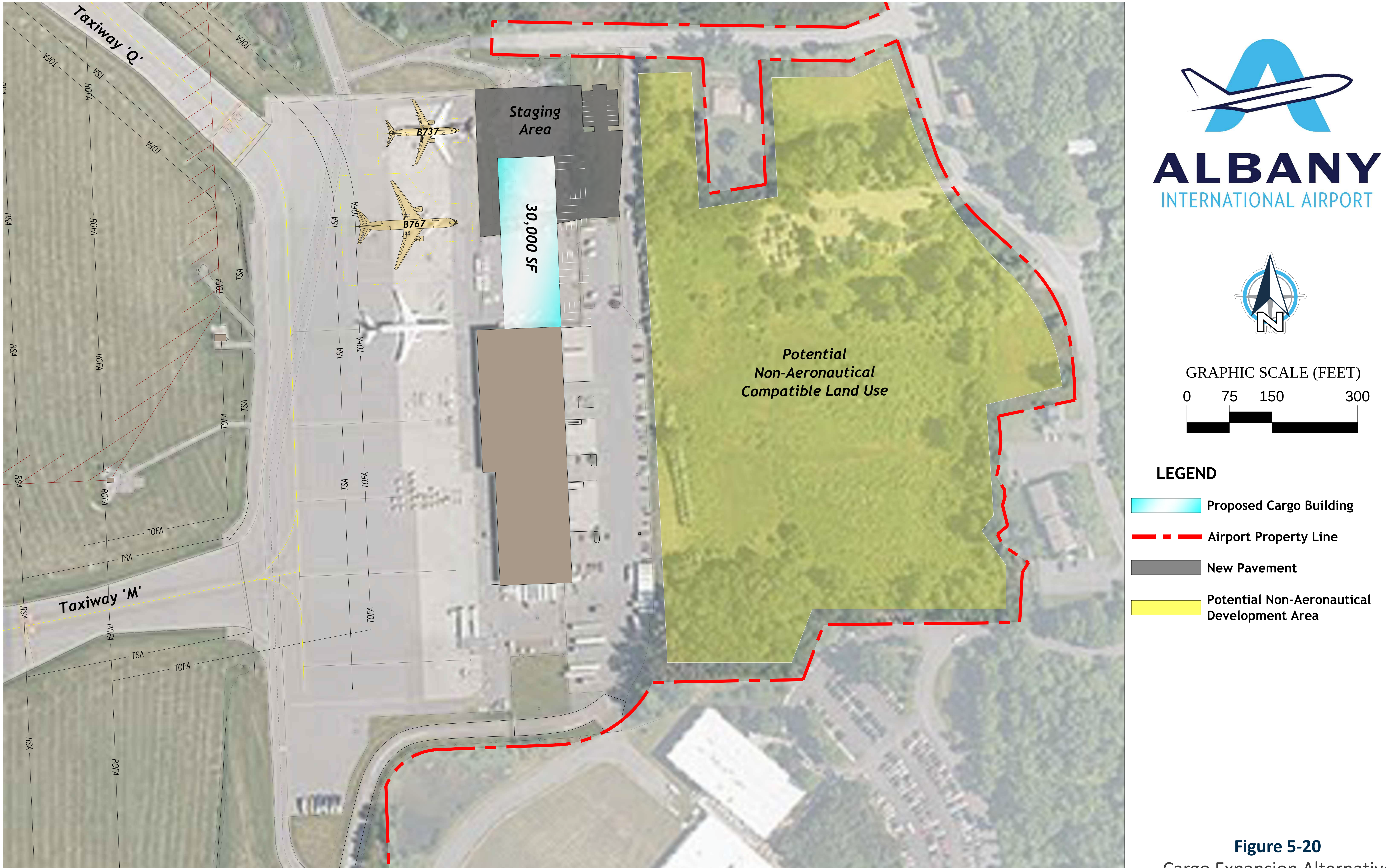


Figure 5-20
Cargo Expansion Alternative

5.8 Support Facilities

5.8.1 Aircraft Rescue and Firefighting (ARFF) Facilities Alternatives

As discussed in **Chapter 4**, while the current ARFF facility satisfies FAR Part 139 requirements for Index C, it is undersized for its current and future staff, equipment, and operations as determined by ARFF management. As federal funding for ARFF projects is limited to satisfying Part 139 only, expansion would not be AIP eligible. Expansion in its current location is possible but is constrained by an existing FBO hangar to the north. Additionally, due to the proximity to wintertime commercial deicing operations and year-round FBO and general aviation activities, continued ARFF operations in its current location causes operational issues in terms of efficient aircraft movement between the two FBO facilities, commercial aircraft deicing operations and congestion from fuel trucks and other service vehicles, itinerant aircraft, and the adjacent parking apron.

Working with Airport management, operations, and ARFF Station personnel, a 'long-list' of alternative locations were considered for an ultimate replacement of the ARFF, including sites more distant from the runways and locations in the Northwest quadrant near the intersection of Taxiways 'A' and 'P.' Based on higher response times and existing site constraints, the alternative locations were narrowed to two feasible sites for further evaluation, as presented below.

Note that if a new replacement ARFF station is constructed in the future, the location of the existing station would ideally be redeveloped for corporate/FBO use, consistent with the existing surrounding development. The current ARFF site can accommodate a large hangar, connected to the existing available apron.

ARFF Northeast Quadrant Alternative

The ARFF Northeast Quadrant Alternative (**Figure 5-21**) depicts an option to relocate the current ARFF station to the area along Sicker Road, southwest of the ATCT/TRACON and airfield maintenance facilities. The ARFF facility would be centralized on the airfield and is depicted at 25,000 square foot of floor area including space for six passthrough vehicle bays. The building height would need to be restricted to 25 feet due to the Runway 1-19 Part 77 Transitional Surface, likely requiring a flat roof. Relocating the ARFF station to this quadrant would consolidate all airport operations facilities (i.e. ATCT, ARFF, and Maintenance) to a single quadrant. Due to the future proposed taxiway, this site is limited in size. If the two-acre parcel to the east (yellow highlighting) became available for sale, it would provide ample development area for the station.

A potential drawback to this location would be the requirement of crossing both runways when providing ARFF support to the passenger terminal area in the Southwest Quadrant, as a majority of the ARFF's responses are to the terminal.

Table 5-21 –ARFF Northeast Quadrant Alternative Summary

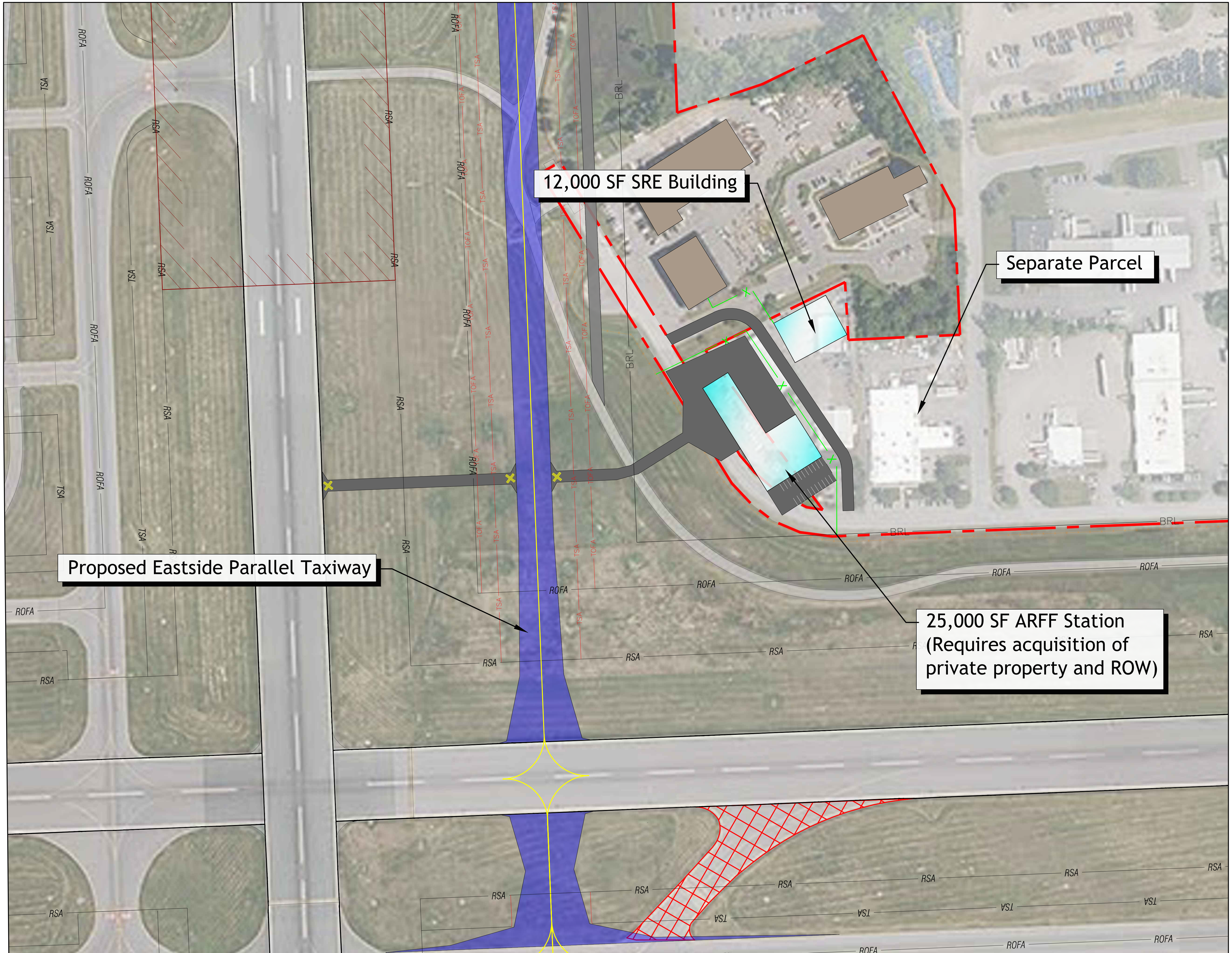
ARFF Northeast Quadrant Alternative	
Centralized location adjacent to the proposed parallel taxiway, with ideal response time to the airfield.	
Opportunities	**Constraints**
✈ Ideal location for airfield response time (centrally located to all runway ends) ✈ Co-location with SRE and airport maintenance facility ✈ No conflict with competing airport uses ✈ Sufficient ARFF facility space for long-term demand (above that required for FAR Part 139) ✈ Existing ground access with available utilities	✈ Requires crossing both runways to respond to ARFF calls at the Passenger Terminal (majority of calls received by ARFF) ✈ Height of ARFF building restricted to 25' due to Part 77 Transitional Surface ✈ Overall size of the site is limited by the future taxiway and associated TOFA ✈ AIP funding cannot be used until the existing ARFF station is 40-years old.

ARFF Southeast Quadrant Alternative

The ARFF Southeast Quadrant Alternative (**Figure 5-22**) depicts a usage alternative to the GA Greenfield Site Alternative 2. A 25,000 square foot ARFF facility would be constructed in lieu of the southeastern-most 50,000 square foot corporate hangar. This area would have fewer constraints in terms of space, airspace, and object free area standards compared to the Northeast Quadrant Alternative. ARFF responses to the passenger terminal area would require crossing the primary runway.

Table 5-22 –ARFF Southeast Quadrant Alternative Summary

ARFF Southeast Quadrant Alternative	
Centralized location adjacent to the proposed GA development in Southeast Quadrant.	
Opportunities	**Constraints**
✈ Improved airfield response time compared to existing station (centrally located to all runway ends) ✈ Abundant space for long-term demand ✈ Existing ground access with available utilities	✈ Requires crossing primary runway to respond to ARFF calls at the Passenger Terminal (majority of calls received by ARFF) ✈ AIP funding cannot be used until the existing ARFF station is 40-years old.



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GRAPHIC SCALE (FEET)
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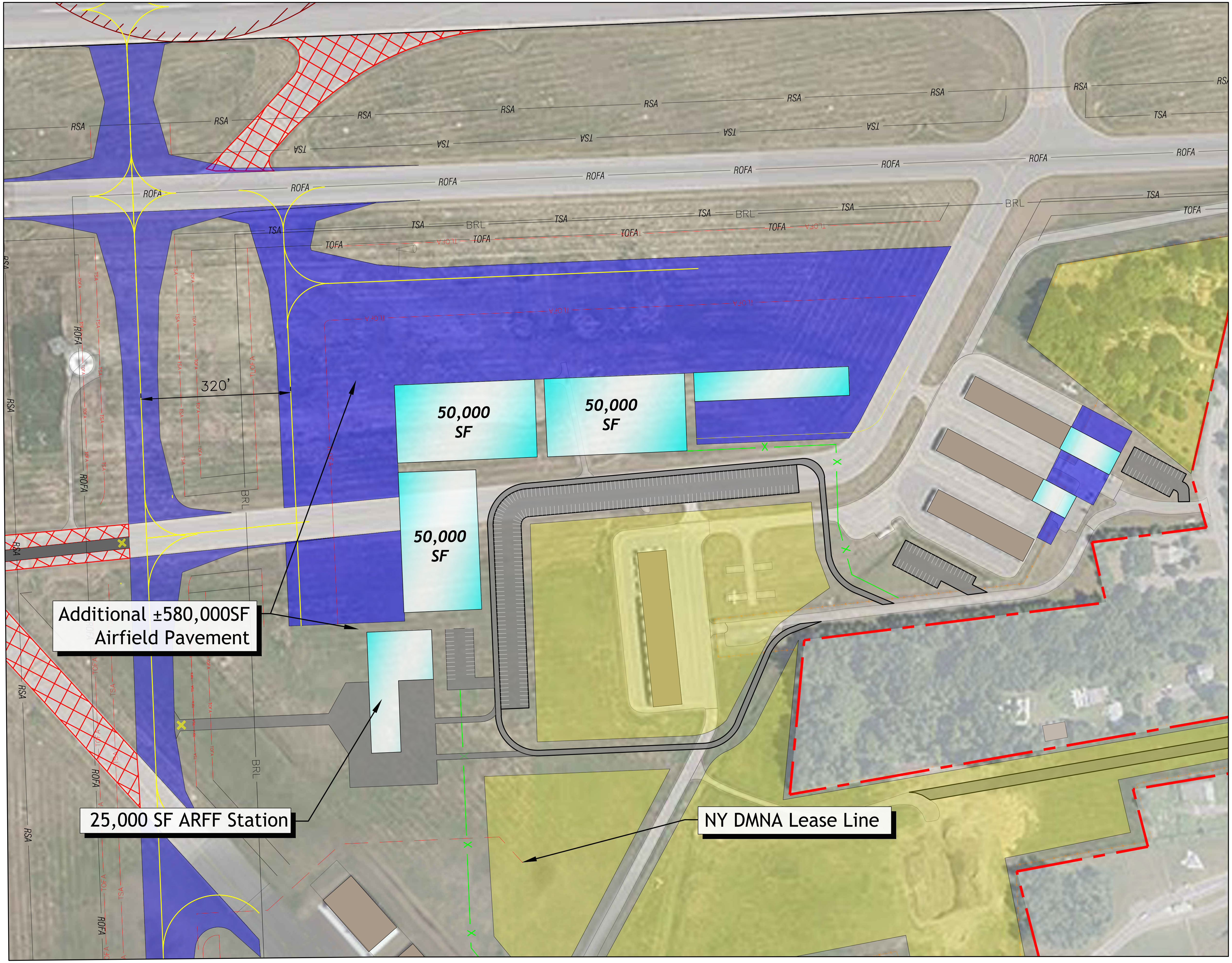
LEGEND

- Proposed Airfield Pavement
- Proposed Building Development
- Proposed Landside Pavement
- Proposed Security Fence
- Airport Property Line

Figure 5-21
ARFF Relocation
Northeast Quadrant



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GRAPHIC SCALE (FEET)
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LEGEND

- Proposed Airfield Pavement
- Proposed Building Development
- Proposed Landside Pavement
- Proposed Security Fence
- Potential Non-Aeronautical Development Area
- Airport Property Line

Figure 5-22
ARFF Relocation
Southeast Quadrant

5.8.2 Snow Removal Equipment (SRE) Buildings

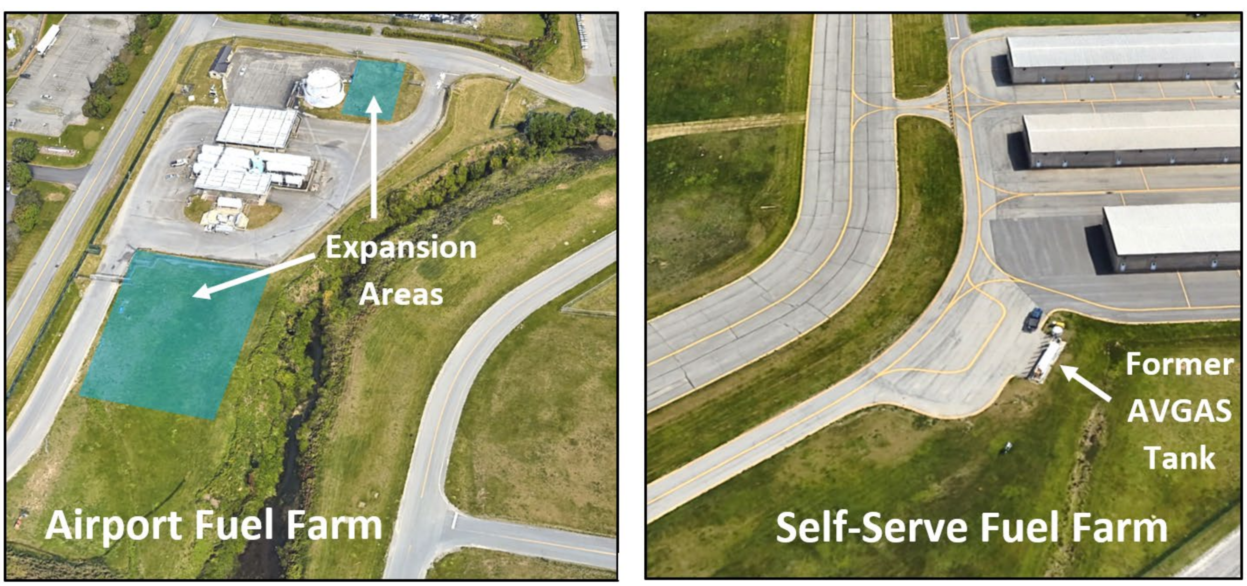
A brief evaluation identified that the Airport has adequate SRE storage to satisfy FAR Part 139 requirements; however, an additional storage building would be beneficial for the additional airport maintenance equipment use by Airport Operations that is above the minimum required. The existing airport maintenance complex located in the northeast quadrant has space available for expansion, see **Figure 4-12.** As such, it is recommended that any additional storage building would be developed and consolidated in that location. It is acknowledged that this potential expansion may not be eligible for FAA funding.

5.8.3 Airport Fuel Farms

Based upon the analysis in **Section 4.7.4**, the airport should plan for a 40% increase in the current Jet-A Fuel storage capacity of 400,000 gallons over the course of the planning period. Review of the existing fuel farm identifed adequate space for this potential storage increase. **Figure 5-23** depicts the existing airport fuel farm located in the northwest quadrant of the airport, and the logical locations for additional tanks. Ground access, utilities, and security is currently provided onsite.

A separate AVGAS 100 low lead (100LL) tank was formerly availble at the self-fuel apron adjacent to T-Hangars A, B and C. This tank was removed due to poor condition and has not been replaced at this time (2023). Replacement of the tank in the same location is recommended in the short-term, with the ability to supply the recently FAA-certified UL94 (unleaded, 94 octane) aviation fuel for piston-powered aircraft.

Figure 5-23 – Existing Aircraft Fuel Farms and Expansion Potential



5.8.4 Urban Air Mobility Alternatives

In recent years, many advancements have been made in the next generation of airborne transportation, focus on both crewed and uncrewed aircraft, exclusively electric powered, operating both traditional winged, along with vertical takeoff and landing aircraft. With the support of NASA, the FAA, and aviation stakeholders, this industry has been termed Urban Air Mobility (UAM) for the potential to expand transportation networks in metropolitan areas. ALB serves the Albany-Schenectady Combined Statistical Area (CSA), thus it is important to look ahead at how the potential for UAM activity could impact the Airport and basic facility requirements and alternatives to accommodate demand.

In April 2023, the FAA released the *UAM Concept of Operations (ConOps), Version 2.0*. That publication describes "the envisioned operational environment that supports the expected growth of flight operations in and around urban areas." The advancement of UAM will eventually aide in supporting passenger and cargo operations in hard to reach, congested, or underserved areas. Per the FAA, UAM advancement will take place in series of increasing levels of autonomy and operational tempo.

The initial phases of implementing UAM will utilize existing helicopter routes, helipads, aircraft aprons, rules and regulations, and air traffic control (ATC) services. As demand for UAM activity increases, so should the demand on infrastructure and procedures. Over time, the FAA will establish and define UAM Corridors from specific aerodromes[1] based on performance requirements. This will also trigger changes to and enforcement of new UAM regulations. As the state of operations mature to become more advanced, and as frequency increases throughout the UAM sector, the previously formed UAM Corridors may form a new network, thus optimizing paths between aerodromes. The number of aerodromes or vertiports would also increase as demand increases. One primary difference between the stages of activity is that once operations have increased to be considered 'mature,' the UAM vehicles may be piloted remotely or autonomously rather than having an onboard pilot in control.

[1] Per the FAA an aerodrome is "a location from which UAM flight operations depart or arrive."

Table 5-23 –Sample UAM Aircraft

Sample UAM Aircraft (under development)	
BETA Technologies CX300	Joby Tiltprop EVTOL
	

As the previously discussed advancements are made, the FAA will continue to define, maintain, and make publicly available the standards and regulations regarding the UAM system; therefore, it is important that ALB review and apply the standards to ensure accommodations of this newly emerging technology. Advancements to current infrastructure at ALB could include, but is not limited to:

- Installing charging stations in the FBO and other GA areas for the aircrafts' electric motors and batteries
- Designated operations areas, including locations for electric Vertical Takeoff & Landing (eVTOL) aircraft in the terminal area, with constructed takeoff and landing routes.
- Construction of one or more vertiports, apron parking, and hangars to accommodate the new aircraft

FBO Apron

It is anticipated that early adopters of UAM usage will be primarily private charters. As such, infrastructure must be in place at the FBO to support such operations. Since ALB currently has established helicopter departure and arrival routes that are controlled by ATC, it is expected that the only addition to the FBO apron is the capability to support electric charging of the UAM aircraft, at a designated parking position. Aircraft may taxi or hover-taxi to the position.

Passenger Terminal Apron

Small electric traditional fixed-wing aircraft have the capability of providing regularly scheduled commuter service similar to the ones operated by Cape Air at ALB prior to 2020. Should such service occur at ALB, the terminal has available ground level gates in Concourse B capable of supporting the operations from a passenger capacity standpoint. Similar to the FBO Apron, the only additional infrastructure required would be electric charging stations.

eVTOL Vertiport

Commercial Passengers

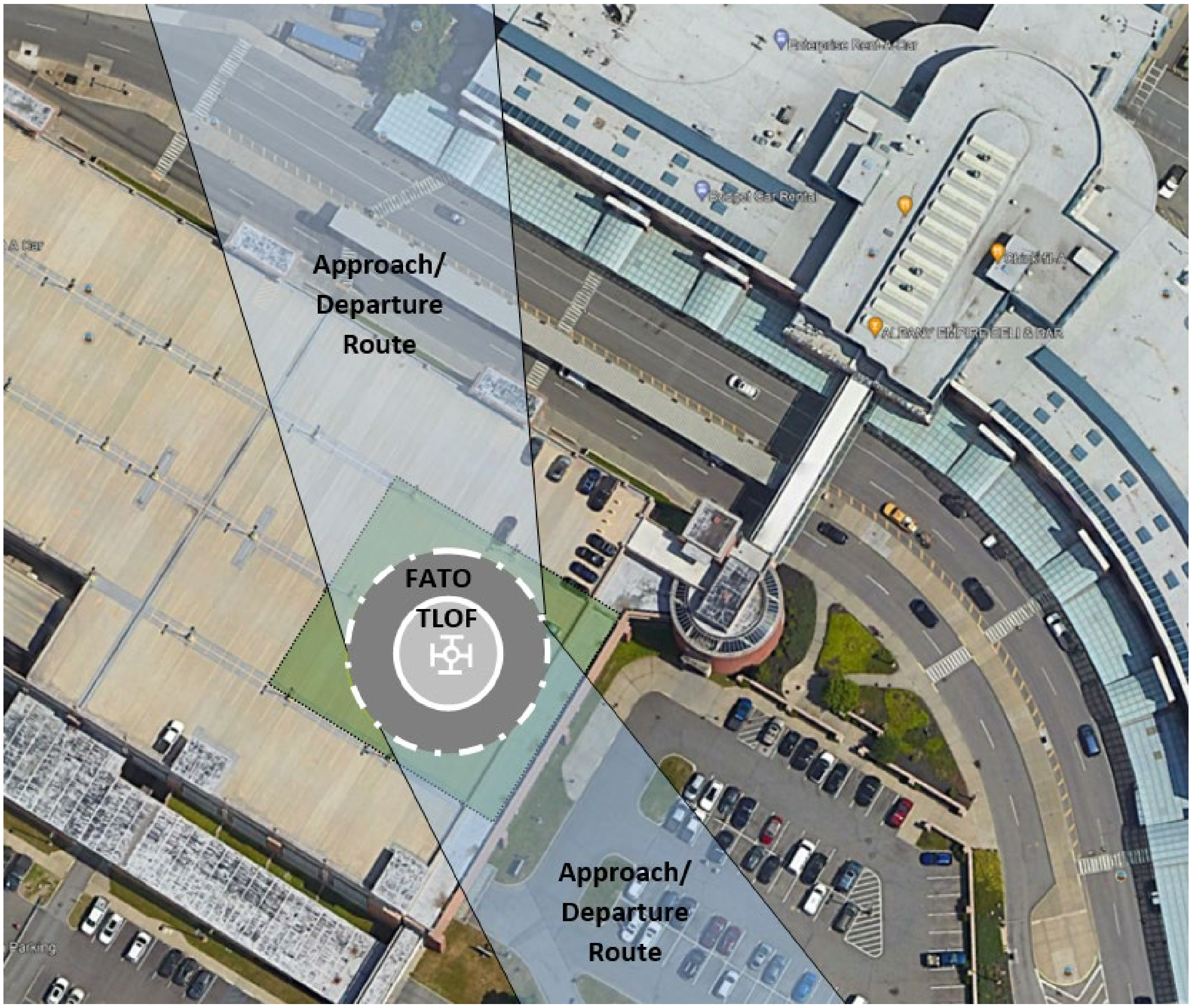
The entrance of eVTOL operations is expected to serve as a shuttle/ferry service connecting the surrounding downtown areas to the airport, providing a quicker alternative to private/hired car and/or public road transportation methods. The service may cater to passengers continuing onto a regularly scheduled commercial flight. As such, the eVTOL would be required to land and disembark passengers landside. As such, a standalone vertiport adjacent to the terminal and outside security would be ideal.

In September 2022, the FAA published *Engineering Brief (EB) 105, Vertiport Design*, specifically catered to eVTOLs. A vertiport is the broad term consisting of the area dedicated for the eVTOLs Touchdown and Liftoff Area (TLOF), Final Approach and Takeoff Area (FATO), corresponding Safety Area, and any support facilities and buildings servicing the eVTOL.

A possible location for an eVTOL vertiport would be on the top-roof level of the existing North Garage confined to the southeastern portion as depicted in **Figure 5-24**. This elevated location would provide clear airspace while being directly connected to the security checkpoint. Infrastructural improvements will be required to support the eVTOL operations including removal of existing lamp posts, construction of electric aircraft charging station, and a small passenger holdroom facility for those departing the airport towards the downtown areas.

It is important to note that EB 105 serves as an interim design guideline to the initial development of eVTOL vertiports as their performance data has not been fully evaluated by the FAA and the technology is rapidly changing. As such, standards may change if development of an eVTOL vertiport should be advanced in the future.

Figure 5-24 – Potential Rooftop Vertiport



Air Cargo

Currently, the largest users of eVTOLs are air cargo operators. As such, infrastructure should be in place to support electric charging in the air cargo apron in the Northeast Quadrant. It is anticipated that the cargo apron has adequate space to support eVTOL operations following the published helicopter procedures issued by the ATC.

5.9 Recommended Development Plan Summary

Based on the review of the Airport's goals and objectives, as well as the needs and constraints identified, specific alternatives were identified as the most reasonable to form the recommended development plan for ALB. This recommended plan improves the safety, operational efficiency, and functionality of the airfield, while incorporating all facilities to satisfy future demand. This section provides a summary of the major concepts in support of the short- and long-term operations of the Airport and is depicted in **Figure 5-24**.

5.9.1 Recommended Airside Developments

Each of the key airfield alternatives identified are recommended during the planning period. These include the following:

Short-term:

- Construct South Service Road
- Property Acquisition – Wade Road Parcel in RPZ
- Eastside Parallel Taxiway – Phase 1 (Runway 1 end to Taxiway 'D') in order to provide access to the Southeast Quadrant for existing and future General Aviation development and connectivity to the GA facilities in the Southwest Quadrant. Includes crossover Taxiway 'E' and partial removals of Taxiway 'G.'
- ROFA Improvements at west end of Runway 10/28
    - Removed portion of employee lot (30 spaces) and relocate entrance
    - Relocate Airport Security fence (2 locations, north and south of runway)
    - Hockey Lane – acquire and remove last 100 feet of Town ROW

Mid-Term:

- Decommission or relocation of the ALB VORTAC
- Eastside Parallel Taxiway – Phase 2 (Taxiway 'D' to Runway 10/28). Includes removal of Taxiways 'D' and 'G.'
- Eliminate direct access to Runway 1/19 from Taxiways 'D', 'E' & 'F', including apron improvements
- Re-Designated Taxiways (per FAA standards)

Long-term:

- Eastside Parallel Taxiway – Phase 3 (extend to Runway 19, with Taxiway 'M' & 'Q' modifications, crossover Taxiway 'B', and service road relocation, with modification of Sicker Road
- Taxiway 'P' Extension to end of Runway 10, with geometry improvement to Taxiway 'K' (north)
- Taxiway 'C' west relocation (400' offset), with geometry improvements to Taxiway 'K' (south)
- Construct Vertiport on roof of North Garage (for eVTOL aircraft)

These recommendations would update taxiway layout to meet current FAA design standards. Additionally, updating all taxiway fillet geometry is desirable, and should be incorporated if and when the associated taxiways are reconstructed. Review of the existing Runway 28 displaced threshold determined that retaining the displacement is required based on the hill and residential development within the approach.

5.9.2 Recommended Terminal Developments

Short-term (including ongoing projects):

- TSA Security Checkpoint (departing passenger processing)
- Concourse A Improvements – Gates, PBBs, Concessions, and Departure Lounge
- Outbound Baggage System Improvements (in-line system)
- Airport Entrance Signalization Improvements

Mid-term:

- Economy Lot E Expansion
- Terminal Access Roadway Improvements, new commercial curbside and GTC, following traffic study

Long-term:

- Concourse B Rebalancing / Improvements.
- New parking garage (or expansion of North Garage).
- Concourse A holdroom expansion is recommended if and when the number of flights and size of aircraft results in seating deficits and congestion.

Beyond Planning Period (if needed):

- Concourse B Expansion may be considered if flight and activity growth well exceed expectations
- Concourse C Expansion may also be considered if flight and activity growth well exceed expectations
- The Ticketing Hall is adequate throughout the planning period; however, the long-term plan incorporates extension to the south (with the removal of the existing office building).
- Inbound Baggage, claim devices, and rental car counters are adequate, but the long-term plan incorporates extension to the north if needed.

5.9.3 Recommended Landside Development

Note that several of the projects listed and included in the Master Plan are dependent on future activity and private investment by existing and potential users and tenants. Such projects include most of the recommended hangar development, air cargo development, and MRO facility expansion. These projects require private investment and lease agreements with the Airport. Thus, their demand and timing are dependent on the tenants. It is acknowledged that more facilities are listed than are likely to be developed during the planning period. This is intentional in order to provide multiple development location options, and to ensure that any future projects will work with the overall Master Plan implementation.

Short-term:

- General Aviation: A large new FBO Hangar to be located on the main apron (up to 50,000 SF). This hangar was previously planned and remains included in the recommendations.
- New AVGAS self-serve fuel tank located at the T-Hangar fueling apron. The tank would provide a new UL94 (unleaded, 94 octane) aviation fuel for piston-powered aircraft.

Mid-term:

- ✈ Expand/Improve Snow Removal Equipment (SRE) Buildings (may not be AIP eligible). Two potential locations are reserved in the recommended plan: within the existing SRE facilities in the Northeast Quadrant, and near the sand storage building in the Northwest Quadrant.
- ✈ The Air Cargo Expansion concept is recommended during the planning period but is dependent on the entrance of an additional air cargo operator.
- ✈ MRO Facility Improvements – Phase 1 located in the northwest quadrant provides for a new 40,000 square foot facility that can accommodate larger regional jets (i.e., Embraer 175). If built, the existing two MRO hangars could be repurposed for GA/corporate use.
- ✈ General Aviation: Business Aviation Development along Taxiway C. Multiple hangars are illustrated providing capacity beyond the anticipated need. This approach is intended to provide numerous locations for potential development.

Long-term:

- ✈ A new ARFF station site is recommended in the Southeast Quadrant. Once the new facility is constructed, the existing site could be repurposed for a hangar or other airfield-dependent uses.
- ✈ MRO Facility Improvements – Phase 2, located in the northwest quadrant. Multiple options are provided for additional hangars supporting larger regional aircraft.
- ✈ Fuel Farm capacity expansion at the existing site. The existing site has space available for additional Jet-A fuel tanks.
- ✈ General Aviation: Business Aviation Development along the proposed eastside parallel Taxiway. Multiple hangars are illustrated providing capacity beyond the anticipated need. This approach is intended to provide numerous locations for potential development.

Airport Studies: In addition to airport project, several studies are recommended during the planning period. These include:

- ✈ Airport Sustainability Management Plan
- ✈ Airport-wide Drainage Evaluation
- ✈ AGIS (next 5-year & long term)
- ✈ Master Plan Update (long term)

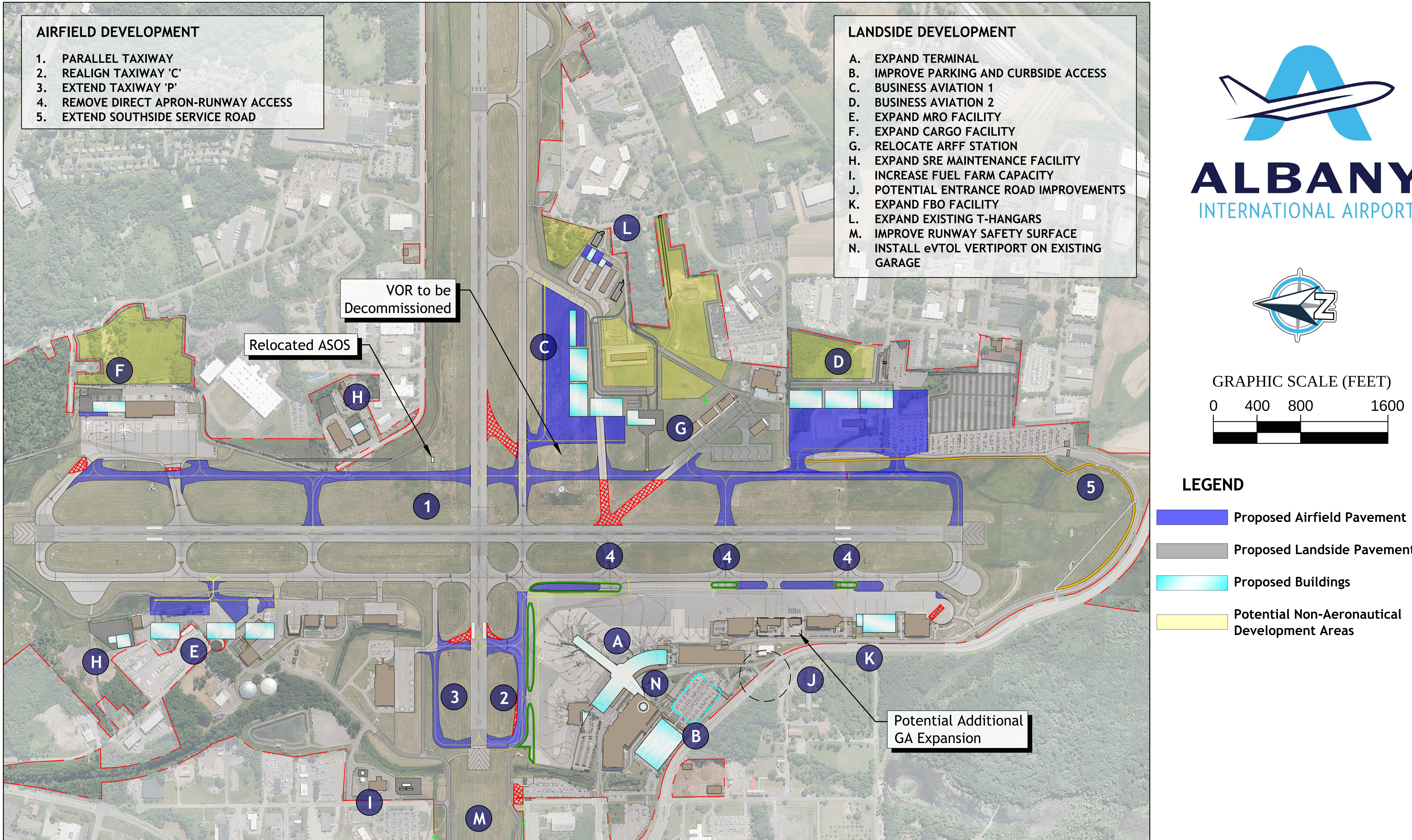


Figure 5-25
Recommended Plan

6 Environmental Overview

This chapter presents a general overview of the environmental conditions of the Albany International Airport (ALB) and immediate vicinity. This overview identifies the environmental categories of greatest concern based upon initial investigation, with emphasis on biological resources, noise, wetlands, water quality, floodplain and cultural resources.

This overview was prepared based on the guidelines of Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* and FAA Order 1050.1F: *Environmental Impacts: Policies & Procedures*.

Consistent with the FAA Orders 5050.4B and 1050.1F, the following categories were reviewed:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources (not applicable to Albany County)
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomics, Environmental Justice, Children's Environmental Health and Safety Risks
- Visual Effects
- Water Resources

The information in this chapter was obtained through on-site field reviews, desktop review of various resources, and review of previous environmental studies for ALB. The sections below provide a summary of the environmental conditions, analyses, and anticipated permits and approvals that may be required prior to specific developments on airport property.

6.1 Air Quality

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) developed the National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These criteria air pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O3), particulate matter (PM), sulfur dioxide (SO_2) and lead (Pb). The EPA determined that these criteria air pollutants may harm human health and the environment, and cause property damage. Nitrogen oxides (NO_X) and volatile organic compounds (VOC) are regulated as precursors to ozone.

The Airport is located in Albany County, NY. Albany County is designated by the EPA as being in attainment with all current NAAQS As the attainment status and the NAAQS are subject to change, the required NEPA documentation for future projects will include discussion of air quality standards and evaluation of potential emissions associated with the construction and operation of the proposed improvements.

6.2 Biological Resources

The airport property consists of a mixture of developed areas, mowed and maintained airfield areas, a stream corridor, forested areas, and wetlands.

6.2.1 Federally Protected Species, Critical Habitat and Essential Fish Habitat

The United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website was reviewed for federally listed species. IPAC was developed to provide a simple tool to identify resources in a given location, as well as identify potential conservation measures. The website indicated that two species of bats, the northern long-eared bat (*Myotis septentrionalis*), an endangered species and the tricolored bat (*Perimyotis subflavus*), a proposed endangered species, have the potential to occur with airport property. Additionally,the Karner blue butterfly (*Lycaeides melissa samuelis*), an endangered species, and the monarch butterfly (*Danaus plexippus*), a candidate species, could also be present within airport property. All of these species are dependent upon specific habitats and host plants. During the NEPA documentation process for future projects, more detailed review of the species specific habitat requirements should be completed to determine the potential effect upon the species.

According to the Natural Heritage Program (NHP)[1] "northern long-eared bats (NLEB) are typically associated with mature interior forests and tend to avoid woodlands with significant edge habitat. NLEB may most often be found in cluttered or densely forested areas including in uplands and at streams or vernal pools, and may use small openings or canopy gaps as well. Captures from NY State suggest that NLEB may also be found using younger forest types. A variety of tree species are used for roosting. The structural complexity of surrounding habitat and availability of roost trees may be important factors in roost selection. Roosts of female bats tend to be large diameter, tall trees, and in at least some areas, located within a less dense canopy. Northern myotis hibernates in caves and mines where the air temperature is constant, preferring cooler areas with high humidity." At ALB, past tree removal projects have relied on seasonal tree maintenance/removal activities to prevent impacts to this species during roosting

[1] New York Natural Heritage Program. 2021. Online Conservation Guide for *Myotis septentrionalis*. Available from: https://guides.nynhp.org/northern-long-eared-bat/. Accessed February 10, 2021.

periods. The summer roosting requirements and range distribution of the tricolored bat are very similar to the NLEB. As the final determination of the listings status for the tricolor bat has not been completed at the time of this report, no designation of critical habitat or specific avoidance and minimization measures for this species have been promulgated by the USFWS. Future NEPA documentation for proposed projects at the airport should include this information when it is available.

According to the NHP[2], "Karner blue butterflies can be found in extensive pine barrens, oak savannas or openings in oak woodlands, and unnatural openings such as airports and right-of-ways that contain wild lupine (*Lupinus perennis*), the sole larval food source." Past studies at ALB have not identified the Karner Blue or wild lupine on the airport property.

The monarch butterfly is a candidate species and has not yet been proposed for listing under the Endangered Species Act so no critical habitat has been designated for the species. The adult butterflies can be found in across the United States as they migrate between overwintering areas and breeding areas. During the breeding season, monarchs lay their eggs on the obligate milkweed larval host plant. Past studies at ALB have not identified large populations of milkweed species within the extensively managed grass within the air operations area of the airport. Future NEPA documentation should include a habitat evaluation of the project area to determine the potential impact upon this species .

Based on review of the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service Essential Fish Habitat (EFH) Mapper, there are no EFH areas, Habitat Areas of Particular Concern, or EFH areas protected from fishing located within the airport property.

Future development projects would need to be evaluated for the potential presence of these listed species and their habitats. Coordination with the USFWS may be required.

6.2.2 State-Protected Species

The New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper (ERM) was reviewed. The mapper identified species listed as endangered or threatened at the north and south ends of the Airport. Therefore, a request was made to the Natural Heritage Program (NHP) to obtain a list of these species. The NHP response (March 2021) indicates that the polygon shown on the mapper to the south represents a listed species which has been determined to no longer occur at that location and does not need to be addressed. A letter from NHP (also dated March 2021), indicates that the NHP has no records of rare or state listed animals or plants, or significant natural communities on Albany International Airport

[2] New York Natural Heritage Program. 2021. Online Conservation Guide for *Plebejus melissa samuelis*. Available from: https://guides.nynhp.org/karner-blue/. Accessed February 10, 2021.

property. However, within ¼ mile of the northernmost Albany International Airport properties is a documented nesting location of bald eagle (*Haliaeetus leucocephalus*), a state threatened species.

The NHP bald eagle guide indicates that "Bald Eagles are typically found near large bodies of water, such as bays, rivers, and lakes, that support a healthy population of fish and waterfowl, their primary food source. Generally, Bald Eagles tend to avoid areas with human activities. They will perch in either deciduous or coniferous trees. Large, heavy nests are usually built near water in tall pine, spruce, fir, cottonwood, oak, poplar, or beech trees. Non-breeding adults and wintering birds are known to have communal roost sites. During the winter, the roost sites may be farther away from food sources. This may be due to the need for a more sheltered, warmer area. Feeding areas during the winter months usually have a high concentration of fish and waterfowl and open water (NatureServe 2005)"[3].

Future development projects may need to be evaluated for the potential impacts to the bald eagle. Furthermore, as part of the NEPA review process for any future project, review and coordination with the NYSDEC may be required.

6.2.3 Migratory Birds

The IPaC uses the location provided to search for known and potential species of concern. For the Airport, the search identified the following list of Birds of Conservation Concern that may be affected by projects on airport property:

- American Golden-plover (*Pluvialis dominica*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Black-billed Cuckoo (*Coccyzus erythropthalmus*)
- Bobolink (*Dolichonyx oryzivorus*)
- Canada Warbler (*Cardellina canadensis*)
- Cerulean Warbler (*Dendroica cerulea*)
- Dunlin (*Calidris alpina arcticola*)
- Eastern Whip-poor-will (*Antrostomus vociferus*)
- Lesser Yellowlegs (*Tringa avipes*)
- Prairie Warbler *(Dendroica discolor)*
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)
- Ruddy Turnstone (*Arenaria interpres morinella*)
- Semipalmated Sandpiper (*Calidris pusilla*)
- Short-billed Dowitcher (*Limnodromus griseus*)

[3] New York Natural Heritage Program. 2021. Online Conservation Guide for *Haliaeetus leucocephalus*. Available from: https://guides.nynhp.org/bald-eagle/. Accessed March 23, 2021.

- Snowy Owl (*Bubo scandiacus*)
- Wood Thrush (*Hylocichla mustelina*)

The snowy owl is a transient and although occasionally seen in New York, it will use available habitat as necessary for resting and foraging. The bald eagle is discussed in Section 6.2.2. Forested and shrubby thickets provide suitable nesting and foraging habitat for the black-billed cuckoo. The American golden-plover, dunlin, lesser yellowlegs, semipalmated sandpiper, ruddy turnstone and the short billed dowitcher are shorebirds, so their habitat is not present within the airport property. Habitat for bobolink is grasslands and the Canada warbler prefers coniferous or deciduous forest with mossy and shrubby understory. The Cerulean warbler prefers mature deciduous forests. The prairie warbler can be found in shrubby areas, forested wetlands and old fields. Habitat for the Eastern whip-poor-will is forest and open woodland. The red-headed woodpecker can be found in open areas with scattered trees, open woodlands and cultivated areas. The wood thrush can be found in mature deciduous and mixed forests and will also nest in suburban areas where trees are large enough.

The airfield provides habitat for many species of grassland birds, but mostly, if not exclusively for foraging. Periodic mowing eliminates habitat for nesting. Proposing work periods can avoid the breeding season of many species. This approach would minimize potential impacts. Future development projects may need to be evaluated for the potential presence of these species and their habitats.

6.3 Climate

Although there are no federal standards for aviation-related Greenhouse Gas (GHG) emissions, it is well-established that GHG emissions can affect climate. The Council of Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses in accordance with the Interim Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (Vol 88 FR 1196, January 9, 2023). As per the 1050.1F Desk Reference, the CEQ has noted, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions; as such direct linkage is difficult to isolate and to understand." GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Emissions of GHGs associated with potential future development of airport property are not anticipated to be significant. Nevertheless, the Airport is incorporating the use of alternative energy wherever practical, including solar, geothermal, and electrification. Although there are no federal standards, climate preservation will be considered in each new project development.

6.4 Department of Transportation Act, Section 4(f)

Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966 requires the approval of the Secretary of Transportation for any project that uses publicly owned land such as a public park, recreation area, or wildlife refuge of national, state, or local significance or a historic site of national, state or local significance.

Based on review of the Wilderness Areas of the United States (**https://wilderness.net/**) and nationalatlas.gov, there are no national forests or wildlife refuges within the airport property. Based on the review of available online mapping, there are no parks within the airport property, however it does show the Mohawk Hudson Bikeway just to the north of airport property, approximately 3,800 feet north of the Runway 19 end.

Based on review of the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) Cultural Resource Information System (CRIS), a portion of the Watervliet Shaker Historic District is within airport property, to the west of the Airport, the National Register listed Ebenezer Hills Jr. Farmhouse is within airport property, to the north of the Airport and the NYS Barge Canal Historic District is located to the north of the airport property. The Ann Lee Pond Nature and Historic Preserve is located to the southwest of the Airport. Future development projects would need to be reviewed by the NYSOPRHP.

Recent and future terminal area projects have coordinated with the Watervliet Shaker Historic District and incorporated mitigation measures where appropriate. This effort will continue for projects in the terminal area and within the southwest quadrant of the Airport.

6.5 Farmlands

The Farmland Protection Policy Act (FPPA) of 1981 authorizes the U.S. Department of Agriculture (USDA) to develop criteria for identifying the effects of federal programs on the conversion of farmland to non-agricultural uses. The prime and unique farmland regulations require that the USDA determine whether land affected by any Proposed Action is prime and unique farmland. If the proposed project involves the acquisition of farmland that would be converted to non-agricultural use, it must be determined whether any of that land is protected by the FPPA.

The Natural Resource Conservation Service (NRCS) classifies soil types as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. According to Web Soil Survey from the NRCS, there are soil types identified as farmland of statewide importance and prime farmland mapped within airport property. However, based on review of the 2010 Census Bureau Map of Urbanized Areas, the airport property is mapped as urban. Areas mapped as urban are exempt from review. Therefore, projects would not require the submission of a Farmland Conversion Impact Rating Form AD-1006.

6.6 Hazardous Materials, Solid Waste, and Pollution Prevention

Hazardous materials are products or waste regulated by the EPA and NYSDEC. These include substances regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and regulations for solid waste management, above ground storage tanks and underground storage tanks (USTs).

The DECinfo Locator (https://gisservices.dec.ny.gov/gis/dil/)was reviewed for remediation sites on and in the immediate vicinity of the Airport property. The results are as follows:

- Albany Army Aviation Support Facility #3 is a state superfund site located at 330 Old Niskayuna Road. This site is on airport property. The NYSDEC Environmental Remediation Database indicates that "As information for this site becomes available, it will be reviewed by the NYSDOH to determine if site contamination presents public health exposure concerns."
- Jack the Stripper is a state superfund site located at 999 Troy-Schenectady Road. This site is off airport property just to the north of the north end of the Airport (approximately 1,700 feet northeast from the Runway 19 end). The NYSDEC Environmental Remediation Database indicates that "Monitoring well sampling showed no groundwater contamination, and the area around the site is supplied public water. There are no future exposures expected."
- Sulzer Turbosystems is a state superfund site at 7 Northway Lane, approximately 2,000-feet east of the Airport. The NYSDEC Environmental Remediation Database indicates that "There is potential for groundwater contamination, however, all area businesses and residences are on public water. Latham public water supply wells in the vicinity of the site are standby wells only. They have not been used for several years and have recently been abandoned and grouted. Site contaminants have been removed, and no surficial contamination remains for direct contact."
- National Semiconductor is a state superfund site located at 3 and 5 Hemlock Street, and is just east of airport property. The NYSDEC Environmental Remediation Database indicates that "Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source not affected by this contamination."

The DECinfo Locator was also reviewed for storage facilities. Based on this review, there are numerous facilities on and surrounding airport property. On airport property, these include the primary aviation fuel farm, as well as other registered storage tanks at the maintenance facility, terminal building, and Army National Guard. Adjacent to the Airport, many private commercial / industrial businesses, and the Town of Colonie, also have fuel and oils storage used for their operations.

A search of the Environmental Protection Agency (EPA) superfund sites did not reveal any sites associated with the airport address or located near the Airport.

Review of the EPA map of Cleanups In My Community Map identified one Resource Conservation and Recovery Act (RCRA) Corrective Action located at 72 Sicker Road. This site is to the west of Runway 19 in the Northwest Quadrant; the site is off-airport but surrounded by airport property. The data indicates that a solution for the cleanup has been implemented.

Solid waste will be generated from construction activities. All activities will utilize reduction practices in order to reduce the amount of solid waste generated. Solid waste resulting from construction activities will be disposed of in an approved debris landfill. At this time, it is not anticipated that any planned activities will exceed available landfill capacities or require any extraordinary efforts to meet applicable solid waste permit conditions or regulations.

6.7 Historical, Architectural, and Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by the ACHP. Revised regulations, Protection of Historic Properties (36 CFR Part 800), became effective January 11, 2001.

The NYSOPRHP CRIS indicates that there are portions of airport property that are designated as archeologically sensitive. Additionally, as noted above, a portion of the Watervliet Shaker Historic District is within airport property, to the west of the Airport, the National Register listed Ebenezer Hills Jr. Farmhouse is within airport property to the north of the Airport and the NYS Barge Canal Historic District is located to the north of the airport property.

Coordination with the NYSOPRHP would need to be conducted prior to significant construction activities, especially those that could impact the historic districts, the listed farmhouse or require earth disturbance. Archeological surveys would not be required for areas that are not archeologically sensitive or have previously been surveyed.

Based on review of the Bureau of Indian Affairs Map of Indian Lands of Federally Recognized Tribes of the United States, there are no mapped lands within the airport property.

6.8 Land Use

The airport property is located within the Town of Colonie and consists of developed areas, mowed and maintained areas, stream corridor, forested areas, and wetlands.

Based on review of the Town of Colonie Zoning District Map, the airport properties are zoned as Airport Business Area (ABA), Commercial Office residential (COR), Single-Family Residential (SFR), Land Conservation, and Commercial Office (CO). Additionally, some of the airport property is within the Airport Noise Overlay. Although the Airport is general exempted from municipal zoning and site plan approvals, coordination with the Town of Colonie is conducted for projects as part of the planning and environmental reviews.

6.9 Natural Resources and Energy Supply

Energy and natural resource demands associated with future projects could include an increase in the demand for supplies during construction. Existing local utility infrastructure would supply energy resources for operation. These resources are available in the area. As indicated previously, the Airport seeks to incorporate alternative and renewable energy in each new or expanded building project in an effort to reduce impacts and costs.

6.10 Noise and Noise-Compatible Land Use

Airport and aircraft noise are regulated at the federal level. Impacts are determined based on average airport noise levels rather than peak noise levels that may occur during a single aircraft takeoff; this noise metric is represented by the day-night average noise level (DNL) decibel level. Residential development and other noise sensitive land uses such as schools, hospitals, nursing homes, and places of worship may be considered incompatible with airport noise above 65 DNL dependent upon the level of noise reduction offered by the structure, if any. All land uses are considered compatible with noise levels of less than 65 DNL.

The Base Year and the recommended 5-year forecast annual operations were used to generate noise contours depicting potential 60, 65, and 70 DNL affected areas as shown in Figures 5-1 and 5-2. The Base Year contours encompass an area of approximately 530 acres that is within the 65 DNL threshold of significant noise impacts. The majority of the contours fall within airport property. Portions of the 65 DNL contour exceed the limits of the airport property, however, they are within areas of compatible land uses (industrial and commercial uses). There is one residential properties within the 65 DNL north of the Airport on Buhrmaster Road. This property was previously mitigated by the Airport during the Airport's Noise Compatibility Program .

The 5-year (2026) forecast contours encompass an area of approximately 720 acres within the 65 DNL threshold, an increase of 190 acres or approximately 35% compared to the Base Year. The additional coverage is mostly concentrated south of Runway 1 where there are no non-compatible land use areas. The increase in contour area results in additional residential properties within the 65 DNL located north of the Airport. Again, these properties were previously mitigated by the Airport using FAA Noise Funding. It is important to note that the Base Year was calculated utilizing data that reflected the effects of the Covid-19 pandemic. As such, the number of operation in the Base Year are far lower than the number of operations in the

2026 forecasted year. Thus, the Base Year contours are not indicative of the noise effects during a normal operating year at the airport.

The evaluation also reviewed the land use within the 60 DNL contour. While not a regulated noise level, residential noise disturbance has been reported in areas within the 60 DNL. As the runways (size and location) have not changed, and no changes are recommended, disturbance areas within the 60 DNL have and will continue to remain nearly the same over time. These locations primarily include the residential areas in the Town of Colonie along Sand Creek Road (to the west of Wolf Road).

Previously, ALB conducted a detailed Part 150 Noise Exposure Map (NEM) Update in 2011 which generated noise contours for 2009 existing conditions, and a 2020 forecasted condition. Areas within the 65 DNL contours totaled 766 acres for the 2009 existing conditions, and 594 acres for the 2020 forecasted conditions. The contours generated for this master plan using the forecasted 2026 operations have a smaller footprint to the 2011 NEM contours due to the advancement in aircraft technology and the phasing out of older aircraft, which tend to be noisier. **Figure 6-1** depicts the existing and 5-year forecasted noise contours.

In conclusion, forecast activity at the Airport will not result in the inclusion of new non-compatible areas within the DNL 65 dB contour.

ALBANY
INTERNATIONAL AIRPORT

GRAPHIC SCALE (FEET)
0 1000 2000 4000

LEGEND

EXISTING 2021		FUTURE 2026
solid green line	60 DNL	dashed green line
solid yellow line	65 DNL	dashed yellow line
solid orange line	70 DNL	dashed orange line
solid red line	75 DNL	dashed red line

Figure 6-1
Existing & Future Noise Contours

6.11 Socioeconomics, Environmental Justice, Children's Health and Safety Risks

6.11.1 Socioeconomics

Socioeconomic impacts are typically defined as disruptions to surrounding communities, such as shifts in patterns of population movement and growth, changes in public service demands, loss of tax revenue, and changes in employment and economic activity stemming from airport development. These impacts may result from the closure of roads, increased traffic congestion, acquisition of business districts or neighborhoods, and/or by disproportionately affecting low income or minority populations. The proposed projects would not involve significant property acquisition or relocation of residents, and socioeconomic impacts are not anticipated.

6.11.2 Environmental Justice

The NYSDEC Map of Potential Environmental Justice Areas in Albany County and the EPA EJ Screen tool were reviewed. The airport property is located within and adjacent to potential EJ populations. During the required NEPA documentation for individual projects, the potential impacts to these populations will be assessed.

6.11.3 Children's Environmental Health and Safety Risks

Children's environmental health and safety risks are associated with the pollution of air, food, water, recreational waters, soil, or products that a child is likely to be exposed to. The anticipated airport needs do not include projects that would have the potential for significant impacts to water, soil, food, recreational waters or air.

6.12 Visual Effects

Of the identified facility requirement, the additional parking requirements (i.e., potential additional structured parking garages) has the potential for visual impacts associated with the Watervliet Shaker Historic District. Similar to past projects, coordination would be completed with the district to incorporate applicable mitigation in the project design. Off-airport measures may also be considered as part of such project planning and development.

The facility requirements did not identify the need for additional approach lighting systems, tall structures or towers, new tree removal areas, or other projects that can have off-airport visual impacts.

6.13 Water Resources

6.13.1 Wetlands

Jurisdictional wetlands and waters of the United States (including Traditional Navigable Waters) are regulated under Sections 401 (Water Quality Certification) and 404 of the Clean Water Act (CWA) for the discharge of dredged or fill materials. Traditional Navigable Waters and associated wetlands are also regulated under Section 10 of the 1899 Rivers and Harbors Act. In addition to these federal regulations, federal agency actions that affect wetlands are also addressed under Executive Order 11990. Federal agencies must document their efforts to avoid and minimize impacts to wetlands through the NEPA process.

Based on review of the NYSDEC ERM, the Airport has the following mapped wetlands:

- state mapped wetland A-10, a Class 1 wetland, is located at the south end of the Airport
- state mapped wetland N-3, a Class 2 wetland, is located at the east end of the Airport
- state mapped wetland N-4, a Class 1 wetland, is located to the north of the Airport

These state regulated wetlands will be avoided as part of the recommended airport developments.

Based on review of the National Wetlands Inventory Map and project specific Jurisdictional Determinations completed for localized areas of the airport in the past, there are various mapped wetlands within airport property. The mapped areas include emergent wetlands, forested/scrub wetlands, Shaker Creek and tributaries, and small ponds. In addition, past projects have delineated additional regulatory wetlands on airport property, including in locations with potential airfield and landside developments.

Impacts to wetlands, streams, and the 100- foot adjacent area of state mapped wetlands would need to be avoided and minimized to the greatest extent practicable. Any necessary permits from the NYSDEC (Article 24 Freshwater Wetlands Act and/or Section 401 Water Quality Certification) and/or US Army Corp of Engineers (USACE), Section 404 would need to be obtained prior to construction.

Based on evaluation of needs and anticipated developments, it is likely that future airport projects will be able to avoid NYSDEC regulated wetlands. However, anticipated projects are likely to have impacts to the federally-regulated wetlands that exist in many locations of the Airport. Such projects will continue to require wetland permits and mitigation with the (USACE). Recently, New York now has approved wetland banks, which permit off-airport wetland mitigation via purchasing wetland credits. This is a beneficial change to mitigation practices, as there is limited property available for on-airport mitigation, and such mitigation has the potential to create new wildlife attractants that may become safety concerns for aircraft operations. The wetlands within the vicinity of the Airport are depicted in **Figure 6-2.**

6.13.2 Floodplains

Executive Order 11988 defines floodplains as the "lowland and relatively flat areas adjoining inland and coastal waters, including flood prone areas of offshore islands, including at a minimum, the area subject to a one percent or greater chance of flooding in a given year." The intent of Order 11988 is to ensure that floodplains and floodways are kept clear of obstructions and facilities that could restrict or increase flow rates or volumes during flood conditions. Encroachment is defined as any action that would cause the 100-year water surface profile to rise by one foot or more. The 100-year floodplain has been adopted by the Federal Emergency Management Agency (FEMA) as the base flood for floodplain management. Both federal and state laws regulate development within floodplains and floodways.

Based on review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), Zone AE (100-year floodplain) and floodway areas in Zone AE, associated Shaker Creek are within a portion of airport property. Additionally, there is a small area of Zone AE associated with the Mohawk River within airport property. Any development within the floodplain would require appropriate permitting. The floodplains within the vicinity of the Airport are depicted in **Figure 6-2.**

6.13.3 Surface Waters and Groundwater

The water quality of surface waters in New York State are classified by the NYSDEC as either "AA", "A", "B", "C", or "D". A "T" used with the classification indicates that the stream supports, or may support, a trout population. All streams and water bodies with a classification of C(T) or higher are regulated by the NYSDEC. Shaker Creek and tributaries traverse airport property. Shaker Creek and the tributaries have been designated by the NYSDEC as Class C/ Standard C.

Shaker Creek is a tributary of the of the Mohawk River. The Mohawk River in this location is a component of the NYS Canal and is therefore a Traditional Navigable Water (TNW). As a result of this connection, Shaker Creek and tributaries are federally jurisdictional.

Based on review of the EPA's Sole Source Aquifer mapper, the airport property is over the Schenectady-Niskayuna sole source aquifer.

In 2018, the Airport completed an airport-wide Drainage Study. The objectives of the study were to:

- To quantify and evaluate the existing condition design flows for the drainage system.
- To evaluate the conveyance capacity of Shaker Creek and assess potential impacts on the closed drainage system.
- To identify problem areas.
- To develop cost-effective mitigation alternatives.
- To assess potential impacts of future development within the watershed.

The study evaluated potential flood impacts on airport property resulting from on-site and off-site drainage within the Shaker Creek watershed. Historical flooding has been observed throughout the Airport, especially in the grassed area between Runway 1-19 and the Economy Lot. The Airport Authority noted localized ponding at the T-Hangars, in the northern terminal area, and along the eastern side of Runway 1-19 near the intersection with Runway 10-28. There were also concerns about the potential impact of tailwater flooding resulting from an undersized culvert at Old Niskayuna Road.

The Drainage Model indicated that the historical problem areas within the Airport are the result of the combination of limited pipe capacity and tailwater impacts from Shaker Creek. Mitigation at these locations is difficult due to factors such as shallow cover depths and minimal gradient of the existing systems, the potential construction impacts to airport operations and the cost associated with replacement of multiple pipe segments.

Since 2018, drainage improvements have been completed in the southeast area of the Airport to improved localized flooding in the Runway Safety Area (RSA). To date, the improvements have been limited to replacing and enlarging drainage piles, and some grading improvements at the southern end of Runway 1/19 in 2020. However, the modeling identified that additional measures, including on and off-airport improvements would be needed to advance airfield and landside developments that create large areas of additional impervious surfaces (i.e., new taxiway pavement, hangars and aprons, and parking facilities). Such drainage improvements and mitigation may be substantial and require significant capital resources.

Non-point sources of water pollution are regulated by the EPA and the NYSDEC. Under the National Pollutant Discharge Elimination System (NPDES), projects involving an acre or more of disturbance are required to provide water quality treatment for runoff in accordance with established guidelines. States are offered the opportunity to administer this program, provided the regulations they promulgate are the same as, or more stringent than the federal regulations. New York has adopted this program and requires that all projects disturbing one or more acres of land comply with the State Pollutant Discharge Elimination System (SPDES) General Construction Permit.

6.13.4 Wild and Scenic Rivers

According to the National Park Service National Rivers Inventory website, there are no river segments designated as Wild and Scenic Rivers in the vicinity of the Airport. According to the NYSDEC list of Wild, Scenic and Recreational Rivers, there are no state designated rivers in the vicinity of the Airport.

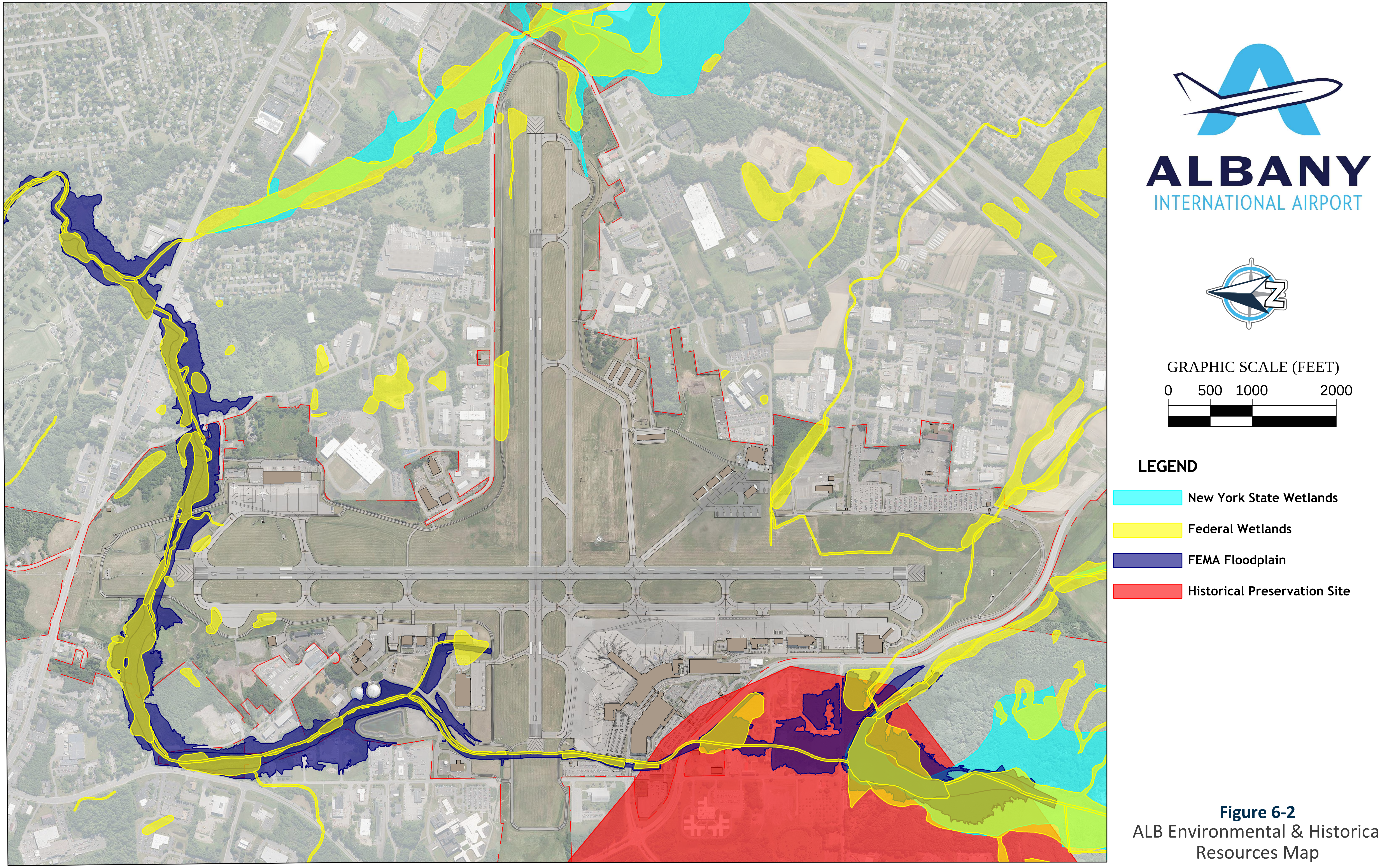


Figure 6-2
ALB Environmental & Historical Resources Map

7 Implementation Plan

Chapter 5, *Development Alternatives* identified and evaluated a series of concepts and presented the overall recommended airport development plan (see **Figure 5-25** *Recommended Plan*) for Albany International Airport (ALB). The plan includes improvements to the airside, passenger terminal complex, and landside/support facilities in terms of priority in three implementation phases during the 20-year planning period. These projects are included in the Airport Capital Improvement Plan (ACIP), which includes a planning-level cost estimate, and anticipated funding source.

This chapter also presents the Airport Layout Plan (ALP) drawing set that depicts the 20-year recommended development at ALB. The ALP illustrates the proposed future airport layout and serves as the official planning document for the Airport. FAA approval of the ALP is a requirement before a project can be implemented.

7.1 Airport Capital Improvement Plan

The Airport Capital Improvement Plan (ACIP) lists the recommended projects and associated cost estimates for the 20-year planning period. Grant-eligible projects at ALB typically receive 90 percent federal funding, although certain federal programs have included 100% funding. The New York State Department of Transportation (NYSDOT) will fund 50 percent of the non-federal funding share (e.g., five percent), with the remaining five percent balance funded by the Albany County Airport Authority (ACAA). Grant-eligible projects include, but are not limited to, planning and environmental studies, airfield development and rehabilitation (runways, taxiways, lighting and navigational aids), security improvements, aircraft parking aprons, obstruction removal, and land acquisition. Projects that are typically ineligible for funding include those that generate revenue and do not directly benefit the public, such as vehicle parking, fuel farms, hangars and other leased areas. A private entity or developer, such as a fixed base operator (FBO) or other corporation, may fund and construct grant-ineligible projects under a lease agreement with the Airport.

In addition to advancing new airport projects, the airport must also continually rehabilitate existing airfield, terminal area, and support facilities (e.g., airfield rehabilitation typically occurs every 10 to 20 years). As such, the ACIP must include these additional capital projects. Although these items are not considered new capital developments, the associated costs can comprise the majority of an airport's annual capital investment.

Although the first two years of projects listed on the ACIP are generally confirmed with FAA and will be actively seeking federal or other funding, the ACIP overall is a planning document and does not constitute a commitment on behalf of the Airport or FAA to fund or advance the listed development. In addition, the ACIP does not assume that the projects would receive environmental approvals but does identify the likely NEPA documentation that will be needed. Thus, the ACIP remains flexible and undergoes annual updates as project priorities, demands, and funding dictate.

The first five years of the ACIP are prepared in detail, and include projects divided into design vs construction, and may separately list each components (e.g., pavement, lighting, signage). The remaining 15 years of the ACIP include significantly less detail and are generally limited new developments identified by the Master Plan. For these remaining years, the listed project costs are planning level estimates (in 2023 dollars) and will be refined as the projects move into the short term.

Table 7-1 below, provides the FAA-Approved 3-year ACIP:

Table 7-1 – Airport Capital Improvement Plan (2024-2026)

2024								
Project Description	FAA / AIP Federal Funding			State Funding		Local Funding		Total
	Entitlement	Discres.	BILL / ARPA	AIP Match	Grant (7)	PFC	Airport	
Rehabilitate Runway 1/19 (1)	$ 6,079,194	$ 4,454,406		$ 585,200			$ 585,200	$ 11,704,000
Airport Sustainability Master Plan		$ 449,303		$ 24,961			$ 24,961	$ 499,225
RPZ Property Acquisition (3.6 ac) (2)	$ 27,000			$ 1,500			$ 1,500	$ 30,000
Construct Perimeter Road (south side)		$ 1,397,700		$ 77,650			$ 77,650	$ 1,553,000
Concourse A Modernization			$ 23,377,410				$3,082,590	$ 26,460,000
Airfield Lighting Controls						$ 500,000		$ 500,000
Intrusion Detection Security System						$ 600,000		$ 600,000
Stormwater & Resiliency Plan						$ 500,000		$ 500,000
Total 2024	$ 6,106,194	$ 6,301,409	$ 23,377,410	$ 689,311	$ -	$ 1,600,000	$3,771,901	$ 41,846,225
2025								
Project Description	FAA / AIP Federal Funding			State Funding		Local Funding		Total
	Entitlement	Discres.	BILL / ARPA	AIP Match	Grant (7)	PFC	Airport	
Replace Three ARFF Trucks	$ 2,700,000			$ 150,000			$ 150,000	$ 3,000,000
Rehabilitate Terminal Apron (3)	$ 1,350,000			$ 75,000		$ 15,000,000	$ 75,000	$ 16,500,000
Rehabilitate General Aviation Apron (3)	$ 450,000	$ 4,500,000		$ 275,000			$ 275,000	$ 5,500,000
Elevator Overhaul / Replacement (4)			$ 2,700,000	$ 150,000			$ 150,000	$ 3,000,000
Replace Pax. Boarding Bridges (5)						$ 2,500,000		$ 2,500,000
Replace Snow Removal Equip. (6)						$ 1,100,000		$ 1,100,000
Environmental Study - MRO Facility						$ 50,000		$ 50,000
Environmental Study - Parallel Taxiway		$ 180,000		$ 10,000			$ 10,000	$ 200,000
Total 2025	$ 4,500,000	$ 4,680,000	$ 2,700,000	$ 660,000	$ -	$ 18,650,000	$ 660,000	$ 31,850,000
2026								
Project Description	FAA / AIP Federal Funding			State Funding		Local Funding		Total
	Entitlement	Discres.	BILL / ARPA	AIP Match	Grant (7)	PFC	Airport	
Rehabilitate Terminal Apron Phase 2						$ 15,000,000		$ 15,000,000
Rehabilitate Taxiways M, Q, & Apron (3)		$ 5,850,000		$ 325,000			$ 325,000	$ 6,500,000
Rehabilitate Perimeter Road	$ 4,500,000			$ 250,000			$ 250,000	$ 5,000,000
SRE Storage Building (3)		$ 4,500,000		$ 250,000			$ 250,000	$ 5,000,000
VORTAC Relocation/Removal		$ 450,000		$ 25,000			$ 25,000	$ 500,000
Eastside Parallel Taxiway (design only)		$ 900,000		$ 50,000			$ 50,000	$ 1,000,000
MRO Facility (design only)						$ 700,000		$ 700,000
Total 2024	$ 4,500,000	###########	$ -	$ 900,000	$ -	$ 15,700,000	$ 900,000	$ 33,700,000

Notes:

1. Includes Centerline Lights and Runway 1 PAPI replacement
2. Vacant property located east of Runway 28
3. Design and Construction Costs - combined
4. Passenger terminal and North Garage
5. Replace PBB at Gates A6 and B6
6. Replace two runway sweepers
7. NYS Capital Grant Program

Legend
Master Plan Recommendation
Airfield rehabilitation
Terminal or Facility rehabilitation
Airport Vehicle/Equipment Replacement

Table 7-2 provides the remaining Master Plan recommended projects, organized into the following three phases:

- Short-Term (0 to 5 years)
- Mid-Term (6 to 10 years)
- Long-Term (11 to 20 years)

Table 7-2 – Airport Capital Improvement Plan (Short-, Mid-, and Long-Term))

Project Description	FAA / AIP Federal Funding	State Funding	Local: Airport	Local: PFC	Private	Total
Short-Term (through 2026)						
Improve Airport Entrance Signalization		$ 330,000	$ 220,000			$ 550,000
Install AvGAS (UL94) System (T-Hangar Apron) (1)		$ 250,000	$ 500,000		$ 250,000	$ 1,000,000
Construct Eastside Parallel Taxiway (Phase 1)	$ 16,200,000	$ 900,000	$ 900,000			$ 18,000,000
Construct FBO Hangar in Southwest Quadrant					$ 9,400,000	$ 9,400,000
Total Short-Term	$ 16,200,000	$ 1,480,000	$ 1,620,000	$ -	$ 9,650,000	$ 28,950,000
Mid-Term (2027-2031) - 5 years						
Mitigate Direct Access to Runway 1/19	$ 1,800,000	$ 100,000	$ 100,000			$ 2,000,000
Re-Designate Taxiways	$ 900,000	$ 50,000	$ 50,000			$ 1,000,000
Construct Eastside Parallel Taxiway (Phase 2)	$ 14,400,000	$ 800,000	$ 800,000			$ 16,000,000
Update AGIS - Obstruction Study	$ 225,000	$ 12,500	$ 12,500			$ 250,000
Expand Economy Lot E			$ 8,000,000			$ 8,000,000
Expand Air Cargo Facility (2)			$ 20,000,000			$ 20,000,000
Expand MRO Facilities (Phase 1)					$ 18,000,000	$ 18,000,000
Develop Corporate/GA Facilities (Phase 1)			TBD		TBD	TBD
Study & Improve Terminal Access Roadway			$ 6,000,000			$ 6,000,000
Airfield Pavement Rehabilitation - 5 years (3)	$ 36,000,000	$ 2,000,000	$ 2,000,000			$ 40,000,000
Landside Facilities Rehabilitation - 5 years (4)				$ 30,000,000		$ 30,000,000
Airport Vehicle/Equipment Relacement - 5 years (5)	$ 2,250,000	$ 125,000	$ 125,000			$ 2,500,000
Total Mid-Term	$ 55,575,000	$ 3,087,500	$ 37,087,500	$ 30,000,000	$ 18,000,000	$ 143,750,000
Long-Term (2032-2041) - 10 years						
Airport Master Plan Update	$ 1,080,000	$ 60,000	$ 60,000			$ 1,200,000
ROFA Improvements (Runway 10 end)	$ 900,000	$ 50,000	$ 50,000			$ 1,000,000
Construct Eastside Parallel Taxiway (Phase 3)	$ 27,000,000	$ 1,500,000	$ 1,500,000			$ 30,000,000
Extend Taxiway 'P' to Runway 10	$ 3,240,000	$ 180,000	$ 180,000			$ 3,600,000
Realign Taxiway 'C'	$ 6,120,000	$ 340,000	$ 340,000			$ 6,800,000
Construct Vertiport (6)			$ 250,000			$ 250,000
Expand Fuel Farm			$ 10,000,000			$ 10,000,000
Relocate ARFF Station	$ 31,500,000	$ 1,750,000	$ 1,750,000			$ 35,000,000
Rebalance Concourse B	$ 10,000,000	$ 10,000,000	$ 10,000,000	$ 5,000,000		$ 35,000,000
Develop Corporate/GA Facilities (Phase 2)			TBD		TBD	TBD
Expand MRO Facilities (Phase 2)					$ 12,000,000	$ 12,000,000
Construct New/Expanded Parking Garage & (7)			$ 60,000,000			$ 60,000,000
Update AGIS - Obstruction Study	$ 225,000	$ 12,500	$ 12,500			$ 250,000
Airfield Pavement Rehabilitation - 10 years (3)	$ 72,000,000	$ 4,000,000	$ 4,000,000			$ 80,000,000
Landside Facilities Rehabilitation - 10 years (4)				$ 40,000,000		$ 40,000,000
Airport Vehicle/Equipment Relacement - 10 years (5)	$ 4,500,000	$ 250,000	$ 250,000			$ 5,000,000
Expand Concourse C	Beyond Planning Period					
Replace Concourse A	Beyond Planning Period					
Total Long-Term	$ 156,565,000	$ 18,142,500	$ 88,392,500	$ 45,000,000	$ 12,000,000	$ 320,100,000

Notes:

Cost estimate are planning-level, not based on design

Funding shares/distribution is best estimate based on airport history

Estimates include Design, Construction, and CI/CA Costs

1. Funding sources TBD (potential for Airport, State, Private)
2. Cargo Building and parking expansion
3. Place Holder for mid/long term ($8,000,000 per year)
4. Place Holder for mid/long term ($4,000,000 per year)
5. Place Holder for mid/long term ($500,000 per year)
6. Limited to lighting and marking (no struture)
7. Includes Roadways. Potential revenue bond and CFC

Legend

Legend
Master Plan Recommendation
Airfield rehabilitation
Terminal or Facility rehabilitation
Airport Vehicle/Equipment Replacement

A few projects were identified in the Master Plan that may not be required during the planning period, as their need depend on future activity growth and peaking characteristics. As such, these projects are included, but listed in as ‘beyond the planning period.’

7.2 Overall ACIP and Funding Plan

Future airport development initiatives rely on a combination of funding sources including airport revenue, often referred to as “local match” and a mixture of federal or state grants. Furthermore, projects could also be funded by third parties or private funds. Funding mechanisms may include:

- Federal grants,
- New York State grants,
- Passenger Facility Charges (PFC) revenue,
- Customer Facility Charge (CFC),
- Airport Revenue and Revenue Bonds, and/or
- Third-party / private development funds.

The funding plan presented in this section represents an initial high-level overview of funding sources that may be available (based on the type of project). In addition, this section does not include all funding sources that are available to the Airport, but rather those that are most commonly used. The above funding sources are described below:

7.2.1 Federal Grants

The authorization of federal Airport Improvement Program (AIP) was provided by the Airport and Airway Improvement Act of 1982, which was a part of the Airport and Airway Trust Fund. Funding under this Act was allocated to provide airport development, planning, and noise compatibility planning and programs. The trust fund is funded through user taxes on airfares, air cargo, and aviation fuel.

The AIP provides more than $3 billion annually in entitlement and discretionary grants to airports included in the National Plan for Integrated Airport Systems (NPIAS). On March 15, 2022, the “Further Consolidated Appropriations Act, 2022” was passed, which included a Supplemental amount of approximately $550 million for discretionary grants through federal fiscal year (FFY) 2024. The supplemental funds are derived from the General Fund.

Federal grants through the FAA are distributed under the AIP as Entitlement grants or Discretionary grants. Entitlement grants are based on the number of enplaned passengers an airport serves annually. Discretionary grants are awarded to projects based on a priority ranking system and funding availability. Projects related to safety, capacity, security (including rehabilitation), and noise mitigation traditionally rank higher based on the National Priority Ranking system. Projects that generate revenue are generally not considered AIP eligible. The

FAA typically covers 90 percent of the cost for eligible projects at Small Hub commercial airports such as ALB.

Entitlement Grants

Entitlement grants are made available to airport's every given year based on a formula set forth in the current version of the FAA Airport Improvement Program Handbook (AIP handbook) published on February 26, 2019. Entitlement grants for airports are calculated using a marginal scale based on the following when $3.2 billion or more is available in AIP in the given fiscal year:

- $15.60 for each of the first 50,000 enplaned passengers
- $10.40 for each of the next 50,000 enplaned passengers
- $5.20 for each of the next 400,000 enplaned passengers
- $1.30 for each of the next 500,000 enplaned passengers
- $1.00 for each enplaned passenger beyond 1 million enplaned passengers

Entitlement grants for each FY are awarded based on prior year's calendar year (CY) enplaned passenger numbers. For example, for FY 2023, enplanements from CY 2021 would be used to calculate entitlements. The annual minimum is $1 million and the annual maximum is $26 million per airport. ALB applies its annual entitlement award to the highest priority project(s) on the ACIP.

Discretionary Grants

Discretionary grants through the AIP program can be awarded annually or as a multiyear commitment to award through a FAA Letter of Intent (LOI). Funds through the discretionary grant program are distributed by FAA regional offices based on availability of funds and project priorities. An LOI is a commitment by the FAA to fund a large project with defined annual funding levels distributed to an airport over several years. However, LOI's must be submitted and approved by the FAA prior to distribution. Since discretionary grants are awarded using a ranking system as opposed to activity levels like entitlements, accurately projecting future awards can be difficult. However, prior award history can be used as a basis to estimate future awards. In the short-term, the FAA can assist the Airport in determining the likelihood of discretionary grants based on existing system projects with previous commitments. At ALB, airfield projects that exceed the annual Entitlements funding allocation, typically will seek to fund the balance of the project with Discretionary funds.

Cargo Entitlement Grants

A cargo entitlement grant is also available as part of the FAA AIP program. The cargo entitlement grant is available to airports with a total annual landed weight of more than 100 million pounds for all cargo aircraft. Cargo entitlements for eligible airports, are calculated based on their percentage of the total landed weight. ALB is not currently eligible for Cargo Entitlements.

Infrastructure Investment and Jobs Act

The Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law (BIL), was passed in 2021 and provides $25 billion in funding for 5-years till 2026. The BIL provides $5 billion in funding for air traffic facilities, $15 billion for airport infrastructure, and $5 billion for airport terminals. The $5 billion allocated to air traffic facilities ($1 billion per year over 5 years) is for the enhancement, sustainment, and/or replacement of air traffic facilities. The $15 billion for airport infrastructure is apportioned up to $2.39 billion per year for primary airports, up to $500 million per year for non-primary airports, and $20 million per year for airport traffic control towers (ATCT). Airport infrastructure funds are awarded based on existing AIP entitlement and cargo formulas, the match requirement follows AIP local match requirements, and projects are evaluated based on specific FAA criteria. Airport terminal funds under the BIL is considered a discretionary grant program and are awarded every year through completion of the BIL based on a competitive grant process. Projects that are closer to construction and provide evidence and justification for these key areas rank well under the program:

- Improves airfield safety
- Replaces aging facilities
- Increases capacity and passenger access
- Encourages competition
- Improvements energy efficiency
- Expands access for persons with disabilities
- Improves airport access for historically disadvantaged populations

Applications submitted under the BIL's terminal program must be submitted each year to be considered for the following year award in this highly competitive program. Funds obligated must be tied to a grant within 3 years, and any unobligated funds will be lost in the 4th year to be distributed to airports on a competitive basis in FY 2030. The Airport has been working closely with the FAA's NY Airport's District Office (NYADO) to apply allocated BIL-AIG funding to ongoing terminal expansions. Additional applications have been made for both Air Traffic Control Tower rehabilitation and additional terminal expansion. At the time, there is no indication that this program will be extended beyond FY 2026.

American Rescue Plan Act (ARPA)

ARPA was approved in March of 2021 as Public Law 117-2. Section 7102 of ARPA provides approximately $8 billion in economic relief to airports to prevent, prepare for, and respond to the COVID-19 pandemic, including relief from rent and minimum annual guarantees (MAG) for eligible airport concessions at primary airports. Funding under ARPA is only available (must be award by) through the end of FY 2024.

Airports under this special program can use ARPA grants for operation costs, dept service, as well as for certain capital projects that combat the spread of pathogens. Therefore, ALB intends to use ARPA to fund applicable portions of the ongoing Security Checkpoint project, including replacing the terminal heating, ventilation, and air conditioning (HVAC) systems and expanding the security checkpoint size for improved social distancing. As with other AIP grants, the FAA NYADO administers these grant funds to airport sponsors.

7.2.2 State Grants

State funding is another mechanism that can be leveraged to help fund airport development project initiatives. The NYSDOT Aeronautics Division periodically provides grant programs to public use airports when included in the State's annual budget. Annually, the state has regularly provided funding to match federal grants (as indicated above), but also periodically provides separate competitive funding for capital projects that are not eligible for federal grants (e.g., hangars and fuel farms) or to accelerate a federally-eligible project's timeline. ALB has received several grants over the years, the largest of which was the 2022 award of $60 million for the ongoing Security Checkpoint Expansion project. The 2022 program was the largest state program thus far, and included a statewide budget of $200 million. More recently, the NYS Aviation Capital Grant Program (January 2023) included a state-wide budget of $50 million for eligible public-use airports, of which ALB was awarded $1.6 million towards the modernization and safety enhancement of the passenger terminal complex.

Other than the federal grant matching program, state grants programs are budget dependent and not a regular annual program with a set budget. Thus, the Airport cannot be assured of future competitive funding through NYSDOT. Rather, the Airport must remain flexible and seek these funding opportunities as they are programed in the future. In recent years, each NYS program has established specific funding priorities. Therefore, project applications for ALB will focus on obtaining the highest possible score for the list criteria in the program.

7.2.3 Passenger Facility Charges

The collection of PFC's was authorized under Title 14 of the Code of Federal Regulations, Part 158, which is administrated by the FAA. PFC's are collected from eligible passengers (paying passengers) to fund eligible airport projects. Since 2001, the maximum PFC an airport can collect per passenger is $4.50 (less $0.11 airline collection fee for the administration of the program). Airports must submit an application to the FAA for approval to collect and use PFC's. Once approved, the FAA grants authority to an airport to impose and use a set PFC amount, with subsequent amendments to further impose or use PFC's. PFC revenues can be used as pay-as-you-go (PAYGO) or leveraged to pay debt service on bonds with a pledge on PFC revenue for the repayment of the debt. PFC revenues can also be used as part of the local match for AIP projects, which could reduce the time needed to wait for airport or state funds to become available. Projects must preserve or enhance safety, security, or capacity of the national transportation system, reduce or mitigate noise, or furnish opportunities for enhanced competition among air carriers.

All AIP eligible projects are also PFC eligible, however not all PFC eligible projects are AIP eligible. Therefore, any future changes to the AIP program also applies to the PFC program. PFC eligibility is broader to include all areas within the terminal for the movement of passengers and baggage, even those that may be revenue generating. However, revenue generating areas within the terminal must be on a common use system and not exclusively leased or used.

ALB's currently approved PFC program commenced in 2009 and extends until July 1, 2027. The program collects PFC's at $4.50 per enplaned passenger with a total collection potential of over $150 million during the 18-year period. For the ACIP, the most likely future use of PFCs will include terminal complex maintenance and improvements. In the mid- or long-term, PFC may be considered for continued terminal complex and support facility maintenance, new projects such as the 'Rebalancing of Concourse B', or facility expansions if activity growth is realized.

7.2.4 Revenue Bond Proceeds

General Airport Revenue Bonds (GARBs) are used to improve, expand, or build future improvements at an airport. GARBs are secured by the pledge of net airport revenues and proceeds from GARBs can be used to fund projects today without having to wait for the Airport to have all the funds necessary to build improvements. As previously mentioned, PFC's bonds can also be issued to pay for future improvements which carry a pledge on PFC's. Double-barreled bonds are payable from both airport net revenues and PFC's.

7.2.5 Customer Facility Charge (CFC)

A CFC is a charge imposed by an airport which is collected and remitted by rental car companies upon a rental car customer renting a vehicle at the Airport. A CFC is a user fee that can be imposed per rental car transaction or per rental car transaction day.

CFCs may be used to fund capital improvement projects related to rental car related facilities such as a consolidated rental car facility (ConRACs) and/or roadway enhancements. If an expansion of the North Parking Garage is pursued in the future, and includes space for rental cars, the airport would have the option to fund that portion of the garage using a CFC. In addition to capital projects, CFCs can be used to pay for operating expenses for rental car facilities such as utilities, shuttle busses, etc. Like PFC's, CFC's can be used on a PAYGO basis or leveraged to pay debt service on bonds with a pledge on CFC revenue for the repayment of the debt.

7.2.6 Tenant or Third-Party

Certain projects may be funded by a tenant or third-party when a project is not eligible for grant funding, the likelihood that a grant award is unlikely, and/or to quickly advance the development timeline. Furthermore, the use of airport funds may not be feasible given the financial investment requirement or a return of investment cannot be obtained in a reasonable timeframe. Typically, likely candidates for tenant or third-party funding could include hangars, fixed base operator (FBO) facilities, parking facilities, or construction of facilities on tenant leaseholds.

At ALB, a recent project that was funding by a third-party includes four new helicopter hangars constructed within the leased area of the NY Army National Guard. Other third-party use projects at the Airport have generally been funded by the Airport, but with the capital cost and debt service paid by a tenant under a lease agreement. Such projects have included hangars constructed for CommuteAir and Piedmont regional airlines. In the future, the Airport could consider the use of third-party funding for corporate hangars through a long-term lease agreement. Such agreements would typically include maintenance requirements and ultimate reversion of the hangar to airport ownership after a set number of years.

7.2.7 Airport Funds

Revenues that remain after operating and maintenance (O&M) expenses, outstanding debt service payments, and transfers to other airport accounts are considered one component of airport funds. Airport funds are often used to pay the local match for AIP projects. More airport funds may be required to cover ineligible portions of AIP projects after state grants or other funding mechanisms are exhausted.

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Each of the revenue sources above may be used to fund the ACIP. Table 7-1 lists a likely source of the funding, but other than the next 2-years, both the funding and project schedule remain flexible.

7.3 Airport Layout Plan

The ALP drawing set illustrates all development projects identified for the Airport throughout the 20-year planning horizon. Upon approval by the FAA, the ALP becomes the official document to be referenced for future development at the Airport. The FAA requires that the ALP be followed consistently regarding all new airport facilities. As such, keeping the drawings accurate and up to date is a high priority. FAA policy recommends that the ALP be updated at least every five years.

Although the ALP is the only drawing that is signed by the FAA, it is part of a larger drawing set that includes the sheets listed in **Table 7-3**.

Table 7-3 – ALP Drawing Index

Sheet Title	Sheet No.
Title Sheet	1
Airport Data Sheet	2
Existing Airport Layout Plan	3
Future Airport Layout Plan	4
Terminal Area Plan	5
Airport Airspace Plan	6
Inner Portion of Approach*	7 - 16
Land Use Plan	17
Airport Property Map	18
*Prepared by Stantec, as part of 2020 Obstruction Study	

7.3.1 Existing and Future ALP Sheets

The initial sheets present critical data of the Airport as a whole, its runway and taxiways, and other conditions as they exist today (i.e., the Existing ALP) and as they are projected to change with the recommended long-term improvements (i.e., the Future ALP). As indicated by the name, the Existing ALP only includes current facilities, with key airfield standards (e.g., Runway Safety Area, Object Free Areas, and Runway Protection Zones) and landside facilities. Key information, such as runway end elevations and runway-taxiway offset, are also illustrated. The proposed ALP includes all features of the Existing ALP sheet, plus each recommended facility for ALB. Several offices within the FAA review this drawing for consistency with airport design standards, flight procedures, and surrounding airspace. To depict proposed facilities for the terminal complex at a larger scale, the included Terminal Area Plan supplements the Future ALP with greater detail.

FAA Approval of the ALP represents the acceptance of the general location of future facilities. However, prior to the development phase of each project, the Airport is required to submit the final locations, heights, and exterior finish of each proposed structure for approval. ALP approval does not represent environmental clearance under the National Environmental Policy Act (NEPA), or compliance with permit requirements. Such approvals must be obtained prior to development and are separate from the ALP process.

It is also noted that ALP approval does not represent a commitment on behalf of the FAA, ACAA, NYSDOT, or others to fund or pursue the projects depicted. Rather, the Master Plan and associated ALP represent the overall planning and development process and depict a broad and long-range view of the potential improvements to the Airport. The ALP drawings were prepared in accordance with FAA design standards for Airport Reference Code (ARC) C-IV, in reference to the following publications:

- FAA Advisory Circular 150/5300-13B, *Airport Design*

- FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- FAA Standard Operating Procedure 2.0 for FAA Review and Approval of ALPs
- Federal Aviation Regulations, Part 77, S*afe, Efficient Use, and Preservation of the Navigable Airspace*

7.3.2 Airport Airspace

The next set of sheets in the ALP Drawing Set illustrate the regulated airspace associated with Title 14 of the Code of Federal Regulations (CFR); Federal Aviation Regulations (FAR) Part 77. FAR Part 77.23 identifies a series of geometric planes (i.e., imaginary surfaces) that extend outward and upward from an airport's runways to define obstruction clearing requirements. These surfaces identify the maximum acceptable height of objects by defining three-dimensional surfaces surrounding all sides of the airfield. When an object penetrates an imaginary surface, it is considered an airspace obstruction and may present a hazard to air navigation.

The Airport Airspace Plan illustrates the overall dimensions of the Part 77 surfaces, and highlights penetrations to the outer surfaces. The next four sheets include the Inner Approach Surface Drawings and provide greater detail regarding the close-in airspace obstructions for each runway end.

The ALB master plan commenced in 2020, during the completion of a detailed FAA-funded Airport Obstruction Study. That study included an airspace survey, and provided a detailed set of inner approach surface drawings for all runway ends, including FAR Part 77, but also included sheets evaluating the following surfaces:

- Operational Approach Surfaces defined in FAA AC 150/5300-13B (Chapter 3)
- Departure Surface defined in FAA AC 150/5300-13B (Chapter 3)
- Precision Approach Path Indicator (PAPI) Surfaces defined in FAA AC 150/5345-28H
- Selected Terminal Procedure (TERPS) surfaces defined in FAA Order 8260.3F

The corresponding obstruction data analysis was provided in an accompanying report. For sample obstructions, the analysis included the object height, penetration, ownership, and proposed action/disposition. General recommendations were provided for each runway end.

In lieu of replicating the data from the Obstruction Study, the Master Plan utilized the information, and directly incorporated the four (4) FAR Part 77 Inner Approach Surface Drawings from the Obstruction Study into the ALP drawing set. These four drawings illustrate the overall airspace and the penetrations to the Part 77 surface. However, several dozen additional obstruction drawings are available in the Airport Obstruction Study with more detailed evaluation.

7.3.3 Land Use Plan & Property Map

The final Sheets in the ALP Drawing Set include a Land Use Drawing and Airport Property Map. The land use drawing illustrates updated airport noise contours generated from the FAA AEDT computer model, depicting the Day-Night Noise Level (DNL) metric used by the FAA to determine impacts to noise sensitive area. The model evaluated current and forecasts activity at ALB five (5) years into the future. As discussed in the Environmental Overview (i.e., Chapter 6), no homes or other noise sensitive land uses are location in the DNL 65 dB noise contour, which is the noise level considered to have significant impacts.

The final drawing sheet is the Airport Property Map which illustrates all parcels that make up the airport property, as well as the year and funding source for each acquisition. At ALB, the vast majority of the property has been owned by the airport for well over 50-years.

As part of the review of airport property and preparation of the drawing, it was confirmed that there are no off-airport properties, parcels, or activities that have access to the Airport or airfield, either with or without airport approval. The FAA considers such access as a "through-the-fence" operation or activity (figuratively), which are highly regulated or prohibited. No such through-the-fence operations exist at ALB. The Airport Property Map is also used by the FAA to depict potential acquisition, review any proposed land releases, and identify parcels acquired with FAA grants. Note that the master plan recommendations include some limited property acquisition, but no land releases or disposal of property.

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Once the master plan is accepted by the FAA, and the ALP is approved (i.e., signed), the study is considered complete. For ALB, the implementation of this study, generally commenced in 2022, and continues indefinitely, or until the study is formally updated. The ALP drawing will remain on file with the FAA and provides a guide for all future developments. Nevertheless, the ALP can and should be periodically updated as requirements change or new opportunities arise.

Appendix A – Public Outreach Program

Public Outreach Program

Public and stakeholder involvement was an integral part of the airport planning process and a key goal of the Albany County Airport Authority (ACAA). As such, the planning effort included a detailed outreach program, with collaboration among the community and airport stakeholders that hold a collective interest in the Airport and the outcome of the Study. The list of airport stakeholders included the airport sponsor, airlines, other tenants, airport users and travelers, local businesses and residents, resource agencies, elected and appointed officials, the Federal Aviation Administration (FAA), the New York State Department of Transportation (NYSDOT), and the general public.

The following methods and forums were employed in the outreach effort:

- **Public Information Study Website** to host airport information, study reports, and collect comments.
- **Public Information Workshops** for outreach to the general public for bi-directional information sharing.
- **Technical Advisory Committee** (TAC) Meetings composed of public and private airport tenants, service providers, airport operations and air traffic control.
- **Regional Advisory Committee** (RAC) Meetings composed of local municipalities, elected officials, regional businesses and universities, and planning associations.
- **Presentations to the ACAA Board,** including board committees.

The study website hosts all report chapters, presentations and meeting minutes prepared throughout the study. Study documents can be reviewed and downloaded for information. Comment can be electronically submitted and are auto-sent to the study team. Comments submitted via the website (or in writing) become part of the permanent study record. These comments and responses are published at the end of the comment period. The study website will remain accessible beyond the completion of the master plan process.

Two Public Information Workshops were held towards the end of the master plan process and included multiple subject matter stations where participants could discuss study components and recommendations with project and airport staff. Meeting 1 was held upon the release of the Facility Requirements Evaluation and Draft Alternatives; Meeting 2 was held at the release of the full Draft Report for review and comment prior to development of the Final Study Report. The meeting dates included:

- Public Information Workshops 1: June 20, 2023
- Public Information Workshops 2: November 8, 2023

Public Information workshop No. 2 was held during the formal 30-day review period of the Draft Report. The review period ran from November 1 through November 30, 2023.

The TAC consisted of technical level representatives of the Airport, comprised of tenants, transportation agencies, and service providers. The TAC was tasked to provide input and insight on technical issues and review working papers at various milestones to ensure that relevant issues were addressed. Four TAC meetings were held during the study at key review points.

The RAC consisted of elected officials, representatives of the local municipalities, business and education leaders, and regional planning agencies. The RAC was tasked to represent the interest of their constituents and organizations and provide outside input regarding airport needs and considerations. Membership of the RAC is listed in the table above. Four RAC meetings were also held throughout the study, on the same day as the Four TAC Meetings.

Membership of the TAC and RAC included the following organizations:

Technical Advisory Committee (RAC)	Regional Advisory Committee (TAC)
FAA New York Airports District Office (ADO)	Capital District Transportation Authority (CDTA)
FAA Air Traffic Control Tower (ATCT)	Shaker Heritage Society
FAA Air Traffic Organization (FAA ATO)	Capital District Physicians' Health Plan (CDPHP)
Transportation Security Agency (TSA)	Capital District Regional Planning Commission (CDRPC)
Albany County Sheriff	Global Foundries
NYS Department of Transportation (NYSDOT)	Albany County Legislature
AvPorts	NAI Platform
ALB Airport Rescue and Fire Fighting	Port of Albany
Million Air	Discover Albany
NYS Division of Military & Naval Affairs (DMNA)	Capital Region Chamber
Prescott Holdings, Inc.	Upstate New York Black Chamber of Commerce
Air Lines Pilot Association (ALPA)	The Gorman Group
Southwest Airlines	Time Union
Delta Airlines	Rensselaer Polytechnic Institute (RPI)
Jet Blue Airlines	Albany County
Piedmont	Town of Colonie
American Airlines	NBT Bank
Federal Express	Empire State Development – Capital Region
UPS	NYS Division of Military and Naval Affairs (DMNA)
NYS Police Aviation	Capital District Transportation Committee (CDTC)
Upper 15 Flying Club	Sierra Club
Local Pilots & T-Hangar Tenants	Operating Engineers Local 158
	Advance Albany County Alliance
	Hudson Valley Community College (HVCC)
	University at Albany
	Alliance for the Creative Economy
	MVP Healthcare
	NYS Economic Development Council (NYSEDC)
	Swyer Companies
	U.S. Senator Kirsten Gillibrand
	U.S Senator Chuck Schumer
	U.S. Congressmen Paul Tonko

The TAC and RAC meeting dates included:

- TAC and RAC Meeting No. 1: February 9, 2021
- TAC and RAC Meeting No. 2: December 8, 2021

- TAC and RAC Meeting No. 3: January 8, 2023
- TAC and RAC Meeting No. 4: October 31, 2023

Meeting materials, recordings, and minutes are provide on the meeting's tab of the study website: http://www.alb-master-plan.com/content/meetings/

In addition to the above, other meetings included presentations to the ACAA Board and Committees, Albany County, NYSDOT, and the Capital District Transportation Committee (CDTC).

Appendix B – Recycling Plan

DRAFT

Albany International Airport
Recycling, Reuse, and Waste Reduction Plan

Prepared By:

CHA

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RECYCLING, REUSE, AND WASTE REDUCTION PLAN

The U.S. Congress passed the Federal Aviation Administration (FAA) Modernization and Reform Act (FMRA) in 2012. The law included several changes to the Airport Improvement Program (AIP), two of which related to recycling, reuse, and waste reduction at airports. Section 132(b) of the FMRA expanded the definition of airport planning to include "*developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable State and local recycling laws, including the cost of a waste audit*." Section 133 of the FMRA added a provision requiring airports that are preparing a master plan to address issues relating to solid waste recycling at the airport. This includes:

- The feasibility of solid waste recycling at the airport
- Minimizing the generation of solid waste at the airport
- Operational and maintenance requirements
- Review of waste management contracts
- The potential for cost savings or the generation of revenue

As defined by Congress, "recycling" refers to any program, practice, or opportunity to reduce the amount of waste disposed of in a landfill. This includes reuse and waste reduction, as well as the recycling of materials. The FAA issued a memorandum on September 30, 2014, to provide guidance on preparing airport recycling, reuse, and waste reduction plans as an element of airport master plans within a sustainability document or as a standalone document. The guidance is mandatory when preparing an airport master plan. The purpose of this Study, which is concurrent with the Master Plan Update, is to review the current recycling, reuse, and waste reduction program and to provide guidance on ways to reduce waste and improve recycling and reuse at Albany International Airport (ALB or the Airport) in compliance with the FAA's guidance.

1.1 AIRPORT DESCRIPTION

ALB, which is classified as a small hub primary airport, is located near Exit 3 of Interstate-87 (The Adirondak Northway), six miles northwest of downtown Albany in Albany County, New York.

ALB facility information is presented in **Chapter 2 – Inventory** of the Master Plan Study.

The Airport is owned and operated by the Albany County Airport Authority (ACAA).

1.2 TYPES OF AIRPORT WASTE

The focus of this plan will be on municipal solid waste. Municipal solid waste generally consists of everyday items which can be legally disposed of in a landfill or equivalent state-permitted facility. FAA guidance identifies municipal solid waste as a type of waste produced at an airport but includes additional waste streams including construction and demolition debris, organic compostable materials (food and yard waste), and deplaned waste. These four types of waste commonly generated at an airport are described below:

- **Municipal Solid Waste (MSW)** includes common inorganic waste such as aluminum and steel, glass bottles and containers, plastic bottles and containers, packaging, newspapers, and other paper products.
- **Construction & Demolition (C&D) Debris** includes any non-hazardous solid waste from land clearing, excavation, or other types of construction, demolition, and/or renovation of buildings, roads, and utilities. C&D debris may include concrete, wood, metals, drywall, carpet, plastics, pipes, and salvaged building components.
- **Compostables** are sometimes referred to as "food" or "green" waste. They include trees, shrubs, grass clippings, leaves, weeds, and small branches, as well as food that is not consumed or generated during food preparation activities but discarded.
- **Deplaned Waste** is removed from a passenger aircraft and can include bottles, cans, paper products, plastic cups, utensils, and food waste.

This plan will focus on the MSW listed above that can be either be recycled or disposed of in a landfill. This plan does not address the management of other types of waste, specifically hazardous waste, universal waste (batteries, fluorescent light bulbs, and other electronics), or industrial waste (used solvents, etc.) given that these materials are subject to Federal, State, and local laws with specific disposal and recycling requirements. It should also be noted that any waste deplaned from international flights is regulated by separate laws.

Waste management at an airport includes many components and can be quite complex. For instance, ALB has agreements with various tenants who have differing operational requirements and disposal processes that contribute to the waste stream at the Airport. According to the FAA's September 30, 2014 guidance, an airport's waste management is broken down into three main areas:

- Areas where an airport has direct control over the waste stream
- Areas where an airport does not have direct control over the waste steam, but can influence waste management; and
- Areas where an airport has no control or influence over the waste stream.

In addition, the FAA's 2013 Recycling Synthesis (see Section 1.8.3 below) further divides an airport's waste stream by locations such as the terminal, airfield, cargo hangars, aircraft, airport construction, flight kitchens, and administrative offices. The main generators of waste at the Airport are tenants, passengers, and Airport employees.

1.3 AIRPORT LAYOUT

The Airport consists of multiple buildings and associated infrastructure owned by ACAA. ACAA has direct control of waste management in several buildings at ALB, but waste generated at tenant leased facilities are not under the direct control of ACAA. Pursuant to the FAA's guidance on airport recycling, areas that ACAA has direct control or influence over should be included in the recycling, reuse, and waste reduction plan. Buildings and areas that ACAA does not have direct control over may be excluded.

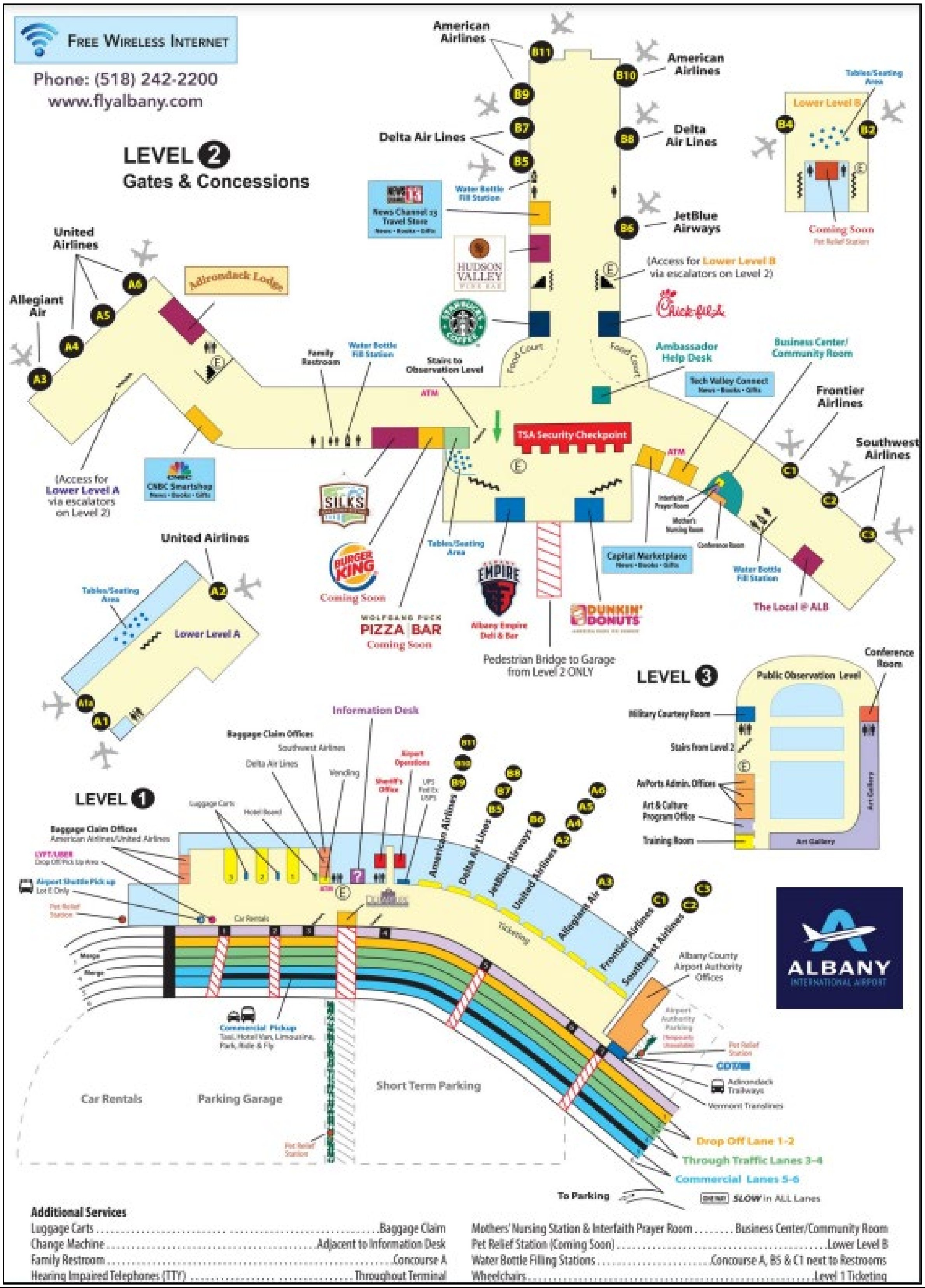
The passenger terminal facility at ALB consists of three levels as shown in **Figure 1-1: ALB Terminal Map**. The components that make up the non-secure area of the terminal, or the area prior to TSA security screening, consist of baggage claim, ground transportation facilities, airline ticketing counters and offices, Sheriff's office, and Airport operations offices on the first floor, concessionaires and shops on the second floor, and airport administrative offices and a public observation level on the third floor. The passenger security screening area, gates, and the concourse connector are within the secure area of the terminal, or post-security screening. Concessions are located in both the secure and non-secure areas.

ACAA has control over waste in spaces devoted to Airport staff including offices, conference rooms, and break rooms, as well as the areas where other Airport maintenance, janitorial, Aircraft Rescue Fire Fighting (ARFF), and police staff operate. ACAA-influenced areas include the leased areas in the terminal building and the passenger focused areas of the terminal. **Table 1-1** summarizes the control or influence ACAA has on waste management at each building or area of ACAA, that are the main focus of this plan.

Table 1-1: Airport Waste Management Areas

ACAA Control	ACAA Influence	No ACAA Control /Influence
Terminal – Airport Staff Areas	Terminal - Passenger Areas	Aircraft Deplaned Waste
Maintenance Building	Airline Ticket Counters, Gates, Concourses, Baggage Handling Areas, & Break Rooms	
Aircraft Rescue & Firefighting (ARFF)/Police Facility	Concessionaires – Burger King, Silks Bistro, Starbucks, Adirondack Lodge, Chick-fil-A, Wolfgang Puck Pizza, The Local @ ALB, Hudson Valley Beer Union, Dunkin Donuts, Empire Deli	Leased Airfield Hangars/Facilities - (Air Cargo) (Any leased hangars/to come with inventory)
	Shops – CNBC Smart Shop, Capital Market Place, Tech Valley Connect, News Channel 13 Shop	Rental Car Cleaning and Maintenance Facilities
	Parking Garage & Rental Car Pick up	

Figure 1-1: ALB Terminal Map



1.4 EXISTING PROGRAM

ALB currently has a well-defined waste management program. ACAA maintains a waste service contract with County Waste that includes both solid waste and recyclable disposal. Compactors provided by County Waste save space, reduce the volume of waste, and reduce operational costs. Appropriate infrastructure for recycling has been introduced throughout ALB in terminal, tenant, and operational areas. Construction projects are evaluated for the potential for reuse and reduction of generated waste. Recycling efforts and initiatives have been effective at ALB, with 51.94 tons of recycling collected in a one-year timeframe and over one million single use water bottles saved over three years with the use of water bottle refill stations. Other programs such as fluorescent light bulb recycling have been beneficial to ALB. These efforts align with ALB's Environmental Policy Statement and allow ALB to uphold and advance its "commitment and responsibility to the environment". The full Environmental Policy Statement can be viewed on the ALB website.

Some of the drivers and challenges to having a plan and implementing waste management policies at ALB include:

DRIVERS

- ✈ FAA Master Plan Requirements
- ✈ Internal and External Stakeholder Support
- ✈ Improved Sustainability

CHALLENGES

- ✈ Funding for Program & Initiatives
- ✈ Tenants and Lease Holders Have to Voluntarily Engage in the Program
- ✈ Ability of Janitorial Staff to Empty Existing Older Receptacles
- ✈ Potential change of services with County Waste

1.4.1 Infrastructure

As previously stated, ACAA has already introduced single stream recycling infrastructure at ALB. Single stream recycling refers to the collection system where all recyclables (including cardboard, plastic, aluminum, etc.) are mixed prior to being recycled. Waste and recycling infrastructure is a critical part of waste management, which begins with the initial point of collection. Collection is facilitated by AVPorts (the ACAA operations contractor) janitorial staff at non-secure airline facilities. Airlines handle trash collection on their aircraft. After collection, solid waste and recycling are deposited in one of three compactors on Airport property which are then collected by County Waste, the contracted waste removal vendor at ALB.

Recycling Bins & Garbage Cans

Waste and recycling receptacles at ALB are shown below.

- Tenant and Operational Areas - Recycling infrastructure is most prevalent in the passenger facing portions of the terminal (both internal and external) and are also present within tenant controlled and operational areas of the Airport. Solid waste and single stream recyclable receptacles at ALB are shown to the right and below. Waste receptacles are round, silver in color and are unlabeled. Recycling receptacles are square, black in color, and clearly labeled as shown.

Most of the receptacles are intentionally located adjacent to one another for user convenience which aids in recycling efforts. Avports janitorial staff are responsible for emptying the receptacles at ALB. Due to the design of the receptacles and the weight of the material inside, staff face challenges when lifting the waste for collection, as the liners must be removed vertically.

Dumpsters & Compactors

After initial collection, the bags of solid waste and recyclables are transported from the initial collection point to compactors provided by County Waste. Also, several dumpsters and open top dumpsters are utilized by ALB.

- The two compactors are located adjacent to the terminal loading dock, near the baggage claim area of the Terminal, and are designated for the Terminal Building’s waste. One compactor is designated for solid waste and the other is designated for single stream recycling. Solid waste is not physically separated before compaction. County Waste is responsible for labeling the compactors. The single stream recycling compactor is clearly labeled as shown below. A third compactor is located on the airside, just south of Concourse C for use for the airlines for solid waste only.
- The solid waste is sorted through for any remaining recyclables at the County Waste Facility.

- Several standard dumpsters are placed at various locations around the Airport for collection of solid waste. One of these dumpsters is for the dedicated use of the ARFF facility. An open top dumpster is located at the maintenance facility. This dumpster is used for metal only, as labeled. These dumpsters are not currently part of the recycling program.

1.4.2 Waste Collection

Avports janitorial staff are responsible for transferring both solid waste and single stream recycling generated at ALB from the initial point of collection to the compactors. Employees work throughout the day to maintain an acceptable level of service.

Tenants, such as airlines and concessionaires, along with TSA staff and Airport staff at the maintenance and ARFF station are responsible for transferring waste generated in their areas to the appropriate dumpsters.

Once collected in the dumpsters, County Waste is responsible for hauling the trash to its next destination. Trash is hauled to a County Waste facility where the recyclable materials are sorted and recycled according to the appropriate disposal stream. There are currently no incentives offered by County Waste for solid waste/recycling, and County Waste does not charge contamination fees. The compactors at ALB are generally emptied once per week but can be picked up on an as-needed basis during times when public waste generation is increased, such as holiday travel periods. Staff at ALB are responsible for monitoring the compactors and requesting a mid-week pickup from County Waste when needed.

1.4.3 Janitorial Carts

Avports janitorial staff collect solid waste and single stream recycling receptacles via the blue tilt truck shown below. They also utilize a janitorial cart with cleaning supplies and one area for waste as shown below.

1.5 CURRENT RECYCLING, REUSE, AND WASTE REDUCTION EFFORTS

ALB has a well-defined recycling program that results in impactful recycling, reusing, and reducing practices around the Airport. These successes are listed below.

Airport Administrative Staff

Airport employees working out of the terminal administrative staff have a receptacle for recycling shredded paper.

Water Bottle Fill Stations

Four water bottle fill stations have been installed throughout the terminal to reduce the number of disposable bottles discarded at the Airport. Each station calculates the estimated number of water bottles saved. The four stations have cumulatively saved 1,228,675 bottles in the 3 years since their installation at ALB.

Construction Debris & Green Waste

Many construction projects at the Airport, inside and outside of the terminal, include special waste management requirements as part of the project specifications. For example, C&D waste generated during airfield rehabilitation projects, such as millings, asphalt, concrete, aggregate, and other materials, are required to be reused or recycled when practical. Some millings are removed from ALB, but most are stored on property for subsequent projects. The airfield maintenance facility has open top dumpsters for construction debris. Most contractors working with ALB manage their own waste removal.

There is currently no procedure in place for the recycling or composting of Green Waste at ALB.

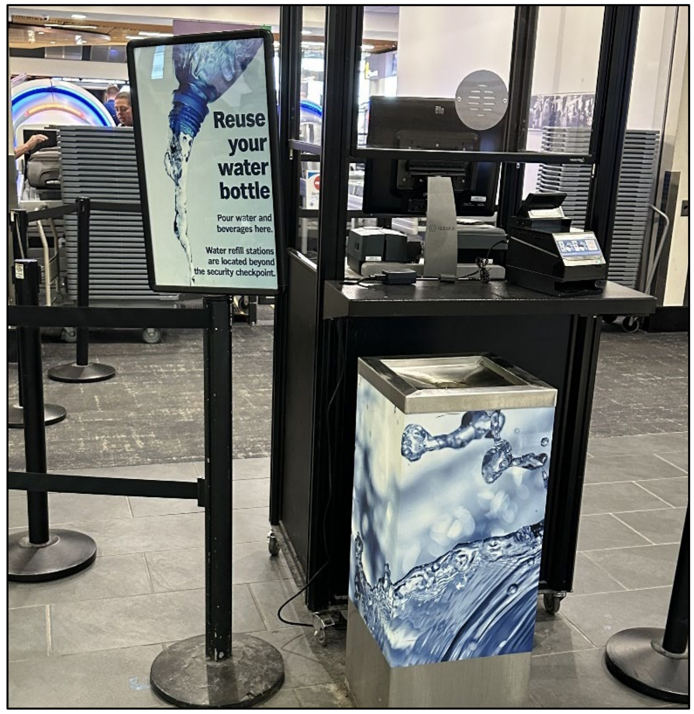
Fluorescent Light Bulbs

ALB currently has a beneficial procedure in place for recycling fluorescent light bulbs; once fluorescent light bulbs at the Airport are burnt out or non-functional, they are transported to an off-site facility to be recycled and ACAA receives a stipend.

TSA

TSA currently collects confiscated items in restricted containers and certain items are then donated to schools, nonprofits, and even to the police. These items may include toiletries that are too large to pass through security, scissors, weapons, etc. Avports janitorial staff collects and discards the waste collected by TSA with the exception of hazardous materials which are handled directly by TSA. Liquid collection bins are located in front of TSA gates and will be discussed in the section below.

Liquids Collection



Liquid filled bottles add significant weight to the waste stream. Without liquid collection, receptacle bags require more frequent emptying to prevent exceedance of comfortable or safe handling weights. Liquids in the waste stream can also contaminate other materials like paper, and may cause rejection by a recycler, which could result in the entire load being landfilled.

Liquid collection stations encourage passengers to empty their reusable and disposable water bottles before approaching the TSA check point. Instead of throwing the bottle away, it can be refilled in the sterile area after screening. The liquid collection stations at ALB are located before the TSA checkpoints and act as a final reminder to passengers about to enter the screening area that liquids greater than 3.3 fluid ounces are not allowed through screening, thereby expediting the screening process. The liquid collection stations at ALB are emptied approximately 20 times per day.

Airlines

While ALB is not a designated hub airport for recycling, certain airlines do separate recyclables generated onboard their aircraft, which are then retained onboard until the aircraft returns to a designated hub airport to be recycled. Waste that is not retained onboard for recycling is collected in the airfield solid waste compactor.

Concessionaires

Buffalo Bio Diesel was contracted by ACAA to collect restaurant's oil/grease waste. Recycling is encouraged in concessionaires' leases, but the decision to use the established recycling infrastructure at the Airport is ultimately the concessionaires.

1.6 WASTE MANAGEMENT CONTRACTS

The FMRA requires a review of existing waste management contracts to address solid waste recycling at the airport. The purpose of this exercise is to potentially identify opportunities to improve recycling scope and efficiency.

1.6.1 Waste & Recycling Contracts

Currently, County Waste is the contracted waste management company for ALB. The contract has been beneficial for ALB, facilitating the Airport's compliance with its Environmental Policy Statement and achieving its overall sustainability goals. Current costs for recycling and solid waste for 2022-2023 total $105,237. Tonnages of solid waste for that period of time was 571.32 and recycling tonnage was 51.94. The Haul Rate and Disposal Rate are the same for solid waste and single stream recycling The Haul Rate is **$175 per load** and the Disposal Rate is **$85 per ton**. County Waste does not charge a contamination fee.

1.6.2 Tenant Leases

ACAA is responsible for managing tenant leases in the terminal building as well as outlying facilities. Tenant leases do not currently require participation in any airport recycling program or standalone recycling and waste management efforts. However, all tenants are offered the opportunity to participate in the airport's recycling plan.

1.7 RECYCLING FEASIBILITY

Federal, State, and local guidelines ensure appropriate waste handling and disposal. This section identifies some of the guidelines.

Federal

The U.S. Environmental Protection Agency (EPA) and the FAA establish the guidelines that regulate solid waste at ALB. EPA guidelines that affect waste handling at the Airport include the Resource Conservation and Recovery Act (RCRA), which describes proper waste management procedures and programs mandated by Congress. RCRA establishes a national framework for waste management procedures, including both non-hazardous solid waste as well as hazardous waste. The laws and guidelines authorized by RCRA are monitored by state officials to ensure that all federal guidelines are followed by local entities. All waste produced at ALB falls under regulations established by RCRA, which includes guidelines for the safe disposal of materials including landfill materials, acceptance of industrial waste, their location, and proper mitigation guidelines for contamination cleanup.

As described earlier, the FMRA includes planning requirements for recycling and waste minimization when completing a new airport master plan. ACAA is meeting those requirements by including this Recycling Plan in the Airport Master Plan. The FAA September 2014 memo also provides guidance on airport waste and recycling, as discussed in this Plan.

State

The New York State Department of Environmental Conservation oversees solid waste management at the state level. The New York State Solid Waste Management Plan ensures safe and sanitary processing and disposal of solid waste in New York.

Community

Waste and recycling projects at other airports have confirmed that passengers have an interest in recycling. Based on the area's recycling programs, area residents have opportunities to recycle and are familiar with general recycling practices. As has been previously discussed, ALB has a commitment to reducing and recycling waste. Passengers and employees who recycle at home or at other businesses around New York are likely to expect ALB to have a recycling program and to participate in that program

1.8 RECOMMENDATIONS

The enthusiasm of Airport staff and ALB tenants to commit to an official program has been a major success factor in any recycling plan. Without the commitment of resources such as funding, labor, time, space, and access to secure areas, a recycling program will struggle to succeed. This section presents recommendations for reducing, reusing, and recycling at ALB based on the information presented in previous sections of this document.

1.8.1 Reduce & Reuse Waste at ALB

According to the U.S. EPA's Waste Management Hierarchy, waste reduction and reuse are the most environmentally preferred waste management strategies. CHA recommends that ACAA focus on reduction and reuse strategies first to reduce the facility's environmental impact. The following reduction and reuse strategies should be evaluated by ACAA to determine which, if any, are feasible and prudent for implementation at ALB.

Source: www.epa.gov, 2022

- ✈ Advertise the water bottle fill stations on the ALB website to encourage the traveling public to make use of the stations.
- ✈ Set ACAA's printers and copiers to default to double-sided printing
- ✈ Continually evaluate the Airport's Procurement Policy to encourage the purchase of sustainable products.

Advertise Water Bottle Fill Stations

The installation of water bottle fill stations throughout the terminal has successfully eliminated 1,228,675 disposable bottles from landfills. Continuing to advertise water bottle fill stations to the flying public on the ALB website will continue to increase the impact of these resources by informing passengers of their availability before arriving to the airport. Additionally, continuing to advertise water bottle fill stations on signage located near liquids collection increases the impact of the stations on both the reduction of generated waste and the wait times for TSA screening.

Receptacles

Waste and recycling infrastructure has been well-implemented and effective at ALB. To ensure effectiveness of the recycling initiatives, ALB should ensure that all solid waste receptacles are located directly adjacent to recycling receptacles to encourage recycling and make recycling a convenient option. The receptacles currently present challenges to employees who collect solid waste and single stream recycling due to the design of the receptacles and the weight of the material. Newly designed receptacles that eliminate the need to vertically remove the filled receptacle liners would improve the efficiency of waste collection at ALB. In addition, clear signage on both solid waste and single stream recycling receptacles would improve the recycling initiatives at ALB. Placement of both receptacles in ACAA office areas would also aid in recycling initiatives.

1.8.2 Construction & Demolition and Green Waste

After establishing goals around reducing, reusing, and recycling C&D debris, ACAA can implement standard procedures around waste tracking during a C&D project. Waste tracking requirements (along with reduce, reuse, recycle requirements), should be included in every construction or demolition project's specifications section.

The Airport may wish to consider adding a Green Waste composting program for both food waste from concessions and lawn/garden waste from the landscaped areas of the airport.

1.8.3 Education & Outreach

The FAA's *Recycling, Reuse, and Waste Reduction at Airports: A Synthesis Document* outlines the essential components of an effective education and outreach program. The program consists of three tasks: initial communication, continuing education, and ongoing facilitation with each stakeholder.

Communication

ACAA should clearly communicate recycling goals and relevant procedures to each person responsible for waste management. Communications with employees and tenants can include written (emails, newsletters, etc.) or in-person conversations, and lead to a methodology that can further engage tenants. In addition, consistent receptacle signage is a large contributor to effective communication.

Employee turnover can be significant at an airport. Initial training should be followed by recurring training to assure that each staff member is aware of program requirements. The training should include reminders about the materials that are accepted and information about some of the positive effects the program is having to reduce, reuse, and recycle at ALB.

External Facilitation

As the program progresses, changes may need to be made which should then be communicated effectively to staff at the Airport. Ongoing communication should be two-way, allowing staff and tenants to ask questions and provide feedback. Interviews with tenants can be utilized to determine if the message is being communicated effectively. It is recommended that ACAA identify a contact email or specific contact person for tenants to ask questions about the program.

Practices that are currently in place have been beneficial and functional for ALB. Initiatives such as recycling receptacles, water bottle fill stations, liquid receptacles, compactors, and fluorescent light bulb recycling, have increased recycling at ALB. Continuing these programs is beneficial to the Airport as well as the community.

1.9 COST SAVINGS & REVENUE GENERATION

The costs associated with a recycling program are dependent on locally available resources, material markets, and the type of waste generated. These costs often include capital costs for containers, landfill tipping fees, hauling costs, recycled material rebates, and labor. Generally, demonstrated reductions in cost are an important part of ensuring the viability and success of an airport's recycling and waste reduction efforts. As a result, the FMRA requires an evaluation of the potential cost savings and revenue generation opportunities for an Airport Recycling, Reuse, and Waste Reduction Plan.

Based on the information gathered in this plan, ALB has engaged in a functional and beneficial program with County Waste with amenities that allow the airport to align with its Environmental Policy Statement while keeping costs low. There were no identified opportunities for the airport to participate in cost saving and revenue generation as defined by the FAA.

There are potential grant opportunities that would allow the Airport to replace or upgrade their existing recycling and waste containers. ALB should explore such opportunities at the local and state level to determine the eligibility of their program.

1.10 CONCLUSION

ACAA has an existing voluntary recycling program with overall effective waste and recycling infrastructure in place. The findings in this plan describe opportunities to increase reduce, reuse, and recycling efforts at ALB. Implementation of the recommendations will assure that the efforts of ACAA and tenant employees are not wasted and that the quantity of materials diverted from landfill increases, lessening the environmental footprint of the Airport and creating an efficient and effective program. The program heavily relies on the contract with County Waste and the program will continue to maintain the same level of service as long as County Waste, or other comparable provider, is the solid hauler. The program will need to be revisited if the contract with County Waste is discontinued.